

(12) **UK Patent Application** (19) **GB** (11) **2 310 351** (13) **A**

(43) Date of A Publication **27.08.1997**

(21) Application No **9603798.1**

(22) Date of Filing **22.02.1996**

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(51) INT CL⁶
A01K 97/12

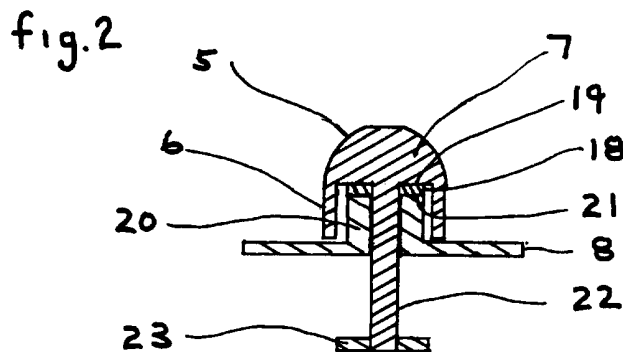
(52) UK CL (Edition O)
A1A A4

(56) Documents Cited
GB 2248755 A GB 2240019 A GB 2149631 A

(58) Field of Search
UK CL (Edition O) **A1A A4**
INT CL⁶ **A01K 97/12**

(54) **Line movement detection mechanism**

(57) A line linear movement detection mechanism includes a base plate 8 and hollow cylindrical bearing pillar 20 which supports and provides a running surface 21 for line roller 7 which has a substantially domed top portion 5 and a substantially cylindrical lower portion 6. Shaft 22 connects the roller to a rotor 23 for triggering an alarm. A pair of line guides (4, Figure 1) are provided in the casing (1 and 2, Figure 1) in which the base plate is mounted. Alternatively, line guides (25, Figure 4) may be attached to the base plate. The line guides are arranged in such a way that when a line passes through both of them it also makes partial circumferential contact with the line roller.



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fig. 1

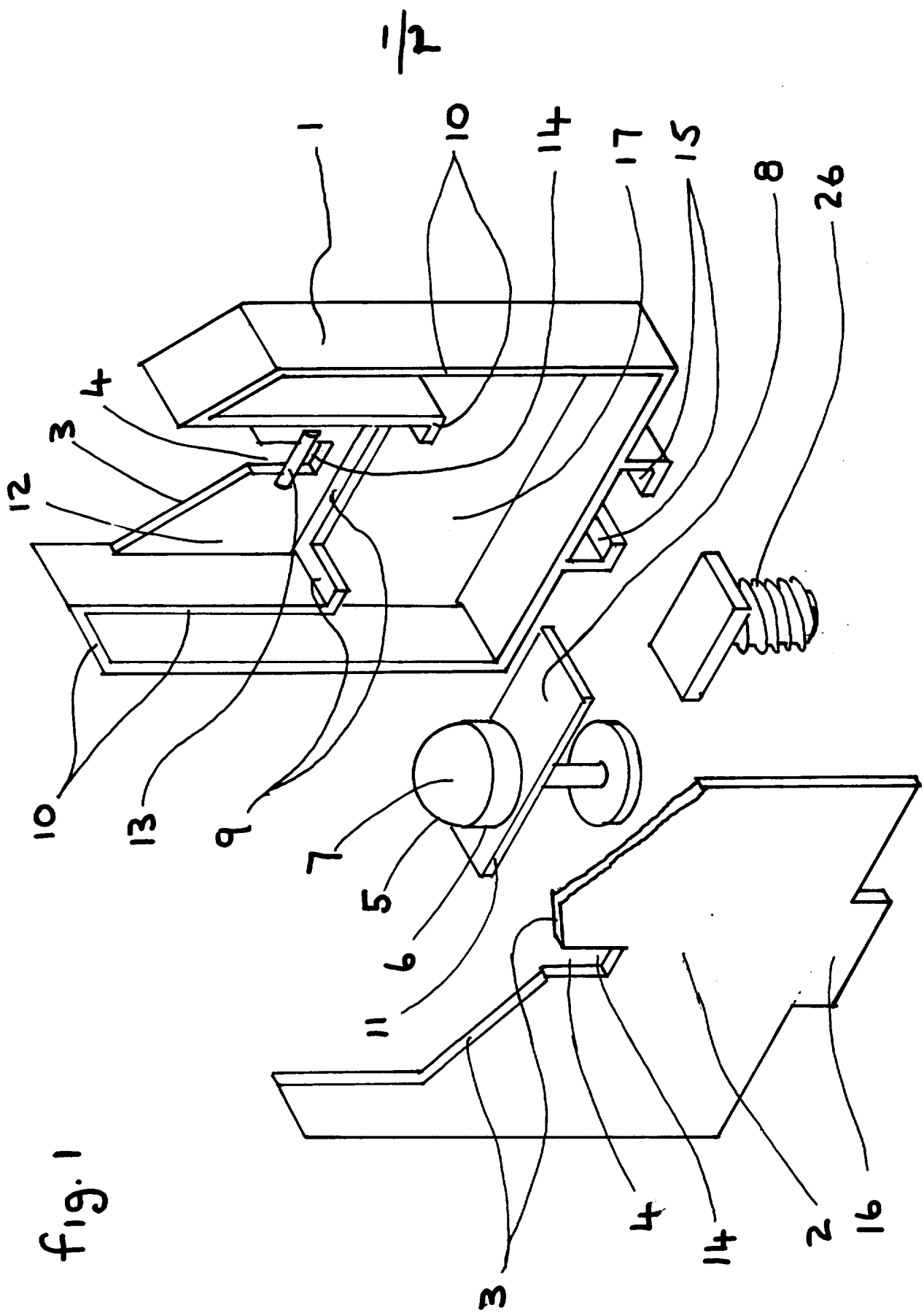


fig.2

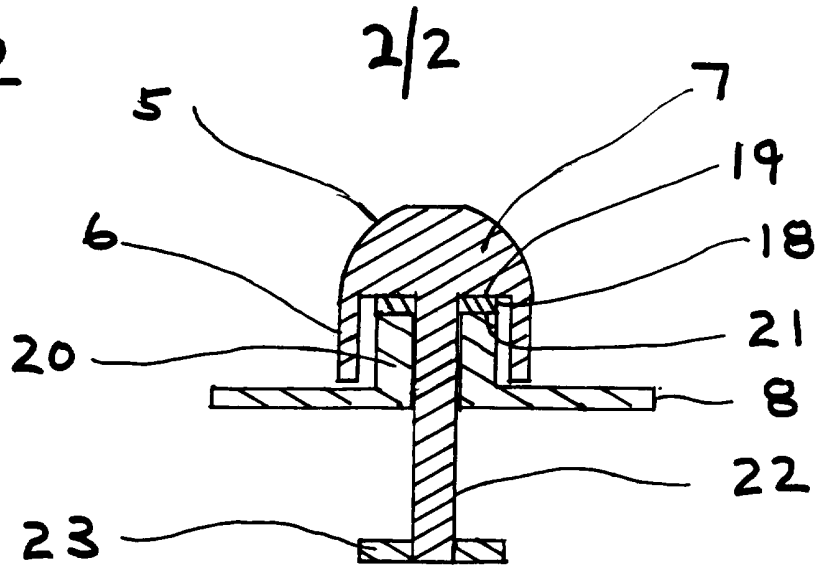


fig.3

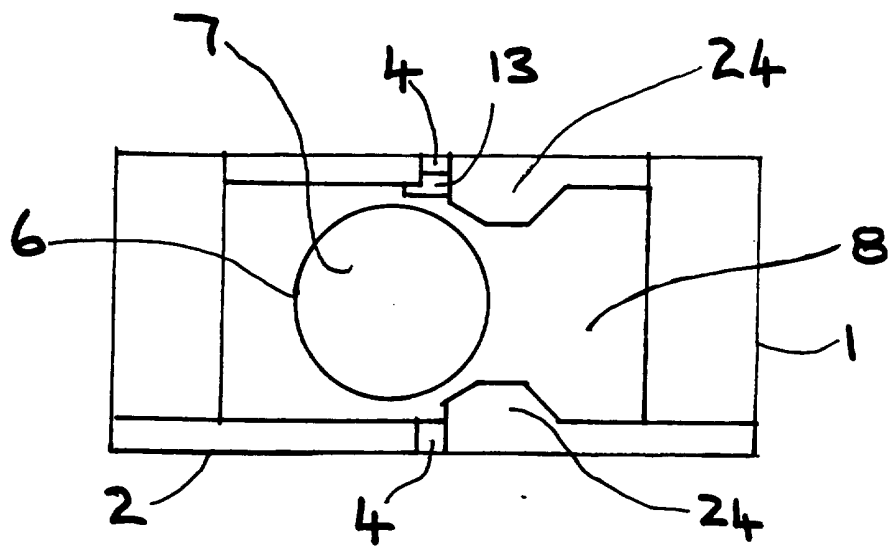
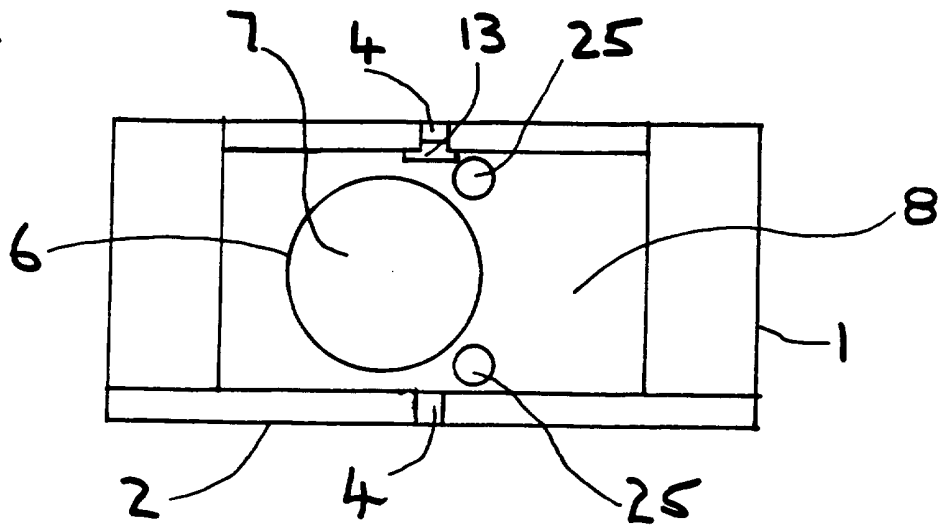


fig.4



Fish bite detector

This invention relates to fish bite detection by means of fishing line linear movement sensing.

A wide range of fish bite detectors have been described in the patent literature. These detectors often sense a fish bite by means such as linear movement of the fishing line, or an increase in tension in the fishing line. Many involve the use of electronic sensing and it is advantageous that the electronic circuit be protected from water ingress in adverse weather conditions. Referring to those detectors which sense fishing line movement, normally by the fishing line passing over and rotating a roller or wheel, it is advantageous that the fishing line makes non-slip contact with the roller or wheel. The roller or wheel is mounted in an external case which provides a recess for the fishing rod to rest in and slots to guide the fishing line into contact with the roller or wheel.

It is an object of the present invention to provide a fishing line linear movement sensing device which reliably translates linear movement of the fishing line into rotation of a roller and also facilitates sealing against water ingress that part of the fish bite detector containing the electronic sensing and alarm circuits.

For those fish bite detectors which include a roller or wheel on a shaft, the bearings for said shaft are often housed in a split external case. The roller or wheel shaft runs in a split bearing in said split case. The split bearing support for the shaft may allow ingress of water into the part of the fish bite detector housing the electronic alarm circuit.

For normal roller or wheel fish bite detectors to operate, tension has to be applied to the fishing line on both sides of the roller or wheel. This is necessary to provide sufficient frictional contact between the roller or wheel and fishing line. Rotation of the roller or wheel and attached rotor lead to triggering of an electronic alarm circuit on fishing line movement due to a fish bite.

The design of the present invention is such that, in order to rotate the roller and attached rotor, tension need only be applied to the fishing line on one side of the roller assembly, with the line on the other side slack.

According to the present invention there is provided a fishing line linear movement sensing device which reliably translates linear movement of a fishing line, due to a fish bite, into rotation of a roller and attached rotor which may be used to trigger an optical or magnetic sensor and associated visible and or audible alarms and which roller and attached rotor rotates when tension is applied to the fishing line on one side of said device with the fishing line slack on the other side of said device and the design of which device assists the prevention of water ingress into that part of the device containing the electronic sensing and alarm circuits.

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

Fig. 1 Shows a partially cut-away exploded perspective view of a fish bite detection device comprising a roller assembly, and a split external case with a support mounting bolt.

Fig. 2 Shows a vertical cross-section of a roller assembly with optional plain bearing.

Fig. 3 Shows a plan view of a roller assembly mounted in a split external case, with optional wrap-round enhancement guides attached to the split external case.

Fig. 4 Shows a plan view of a roller assembly mounted in a split external case, with optional wrap-round enhancement guides mounted on the assembly base plate.

Now referring to the drawing Fig.1. The split external case parts 1 and 2 provide a recess 3 for the fishing rod to rest in. The vertical slots 4 provide guides for the fishing line to pass over the substantially dome shaped head 5 of roller 7 to make contact with the roller substantially cylindrical side portion 6 and line stop 13. A line stop is provided in one or both vertical line guide slots. The roller base plate 8 is supported by the ledge 9. The vertical slot 4 has a lower portion 14 which extends to the top of the base plate to provide drainage of the roller cavity 12 which is bounded by the split external case. The split case parts 1 and 2 and roller base plate 8 may be joined together by applying water proof adhesive to face 10 in case part 1 and face 11 on the base plate 8 and the upper surface of ledge 9, or may be joined by mechanical means and sealed by their interference fit or a gasket or sealing

compound. The assembled fish bite alarm is attached to a support by means of threaded bolt 26 which locates in slots 15 in case part 1 and is held in place by the extended lower portion 16 of case part 2. The electronic alarm circuits are housed in cavity 17.

Now referring to Fig.2. This shows a vertical cross-section of the roller assembly. The roller 7 has a substantially domed top portion 5 and a substantially cylindrical lower portion 6. The roller has a flat under surface 19 which may run on the flat top surface 21 of the bearing support pillar 20. An optional low friction plain bearing 18 is shown between the flat surfaces 19 and 21. A shaft 22 connects the roller 7 to the rotor 23. By being higher than the drain slots 14, pillar 20 also acts as a barrier preventing water passage, down the gap between shaft 22 and pillar 20, into the electronics containing cavity of the fish bite detector.

Now referring to Fig.3. This shows the optional wrap-round guides 24 attached to the split external case. These guides optionally increase the circumferential contact between the fishing line and the substantially cylindrical lower portion 6 of roller 7.

Now referring to Fig.4. This shows optional wrap-round guides 25 mounted on the assembly base plate 8. These guides are an alternative means of optionally increasing the circumferential contact between the fishing line and the substantially cylindrical portion 6 of roller 7.

The design of the fishing line linear movement sensing device is such that the bearings for the shaft connecting the roller and rotor are independent of the split external case.

Due to the fishing line wrap-round the roller, either with or without wrap-round enhancement guides, tension need only be applied to one end of the fishing line in order to generate sufficient frictional contact between the line and roller to cause rotation of the roller and rotor triggering device and activation of the electronic alarm circuits when the fishing line moves linearly due to a fish bite.

In the above example, the roller is shown with a substantially dome shaped head and substantially cylindrical lower portion, however the roller may be of any shape which sufficiently displaces the fishing line to one side of the straight line drawn through the fishing line guide slots and

thereby generates sufficient frictional contact between the fishing line and roller which leads to non-slip rotation of the roller when the fishing line moves linearly due to a fish bite.

Also in the above example, the external case is shown as split vertically, however it may be constructed in any manner capable of accepting the roller assembly.

The roller assembly comprises a base plate with a hollow substantially cylindrical bearing pillar at right angles to it and a roller and a shaft and a rotor means of triggering an electronic fish bite alarm circuit. The hollow bearing pillar provides vertical location for the line roller shaft which passes through the bearing pillar. The shaft has a roller at one end and a rotor means of triggering an electronic alarm circuit at the other. The roller and shaft and rotor are fixed together by interference fit or adhesive or the like and rotate when the fishing line moves linearly due to a fish bite. The means of detecting rotational movement of the rotor may be any means known to a person skilled in the art of rotation sensing. For example, by optical or magnetic means. The roller has a recess on its underside which is a clearance fit over the base plate bearing pillar. The top of the roller recess and the top of the base plate bearing pillar provide flat surfaces for the roller to rotate on. An optional low friction plain bearing may be placed between these two flat bearing surfaces. The shaft passes through a substantially cylindrical hole in the optional low friction plain bearing.

The fish bite detector device comprises said roller assembly and an external case which accepts said roller assembly. Said external case may be specially manufactured, or may be an existing fish bite detector external case modified to accept said roller assembly. Whether specially manufactured or modified, the external case also provides for other requirements of a fish bite detector. For example, means of supporting a fishing rod, means to facilitate the engagement of the fishing line with the roller, a cavity to house electronic rotation sensing and alarm circuits.

CLAIMS

1. A line linear movement detection mechanism including, a base plate with a hollow cylindrical bearing pillar attached at right angles above it with the hole in the bearing pillar extending through the base plate, a cylindrical shaft which passes through and beyond the ends of the hole through the bearing pillar and base plate, a roller which is substantially cylindrical around its lower axial portion and substantially domed around its upper axial portion, the roller being axially attached to the shaft above the bearing pillar such that the underside of the roller is supported by and runs on the top of the bearing pillar, a rotor means of triggering an alarm, the rotor being axially attached to the shaft below the base plate, a pair of line guides which are positioned in such a way that when a line passes through both guides it is displaced to one side of the straight geometric line passing through both guides and it also makes partial circumferential contact with the substantially cylindrical side of the roller.
2. A mechanism as claimed in Claim 1 where the line guides are provided as part of a detector casing in which the base plate is mounted.
3. A mechanism as claimed in Claim 1 where the line guides are provided as attachments to the base plate.
4. A mechanism as claimed in any preceding claim where a thin hollow cylindrical low friction plain bearing is located around the shaft between the underside of the roller and the top of the bearing pillar.
5. A mechanism as claimed in any preceding claim where the height of the bearing pillar is greater than the depth of water which could lie above the base plate in wet conditions, to prevent water passing down the gap between the shaft and bearing pillar towards the rotor and associated electronics.
6. A mechanism as claimed in any preceding claim where the underside of the roller has a cylindrical recess which accepts the top of the bearing pillar and the optional low friction bearing, to prevent water running along the bottom of the roller and down the gap between the shaft and bearing pillar towards the rotor and associated electronics.
7. A mechanism as claimed in any preceding claim where pulling the line external to one of the line guides, with the line slack external to the other line guide, generates sufficient frictional contact between the line and roller to rotate the roller and attached shaft and rotor.
8. A line linear movement detection mechanism substantially as herein described and illustrated in the accompanying drawings.



Application No: GB 9603798.1
Claims searched: 1-8

Examiner: R F PHAROAH
Date of search: 14 May 1997

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.O): A1A: A4

Int Cl (Ed.6): A01K: 97/12

Other:

Documents considered to be relevant:

Category	Identity of document and relevant passage	Relevant to claims
A	GB 2248755 A (DAIWA)	1
A	GB 2240019 A (THELS)	1
A	GB 2149631 A (CARBONITE)	1

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.