[Document Name] Description
[Title] Spinning Reel for Fishing
[Technical Field]
[0001]
The present invention relates to a spinning reel for fishing, and more particularly, to a spinning reel for fishing comprising a fishing line guide provided on an arm lever of a rotor.
[Background Art]
[0002]
Generally, a spinning reel for fishing comprises a rotor that rotates and a spool that moves back and forth in response to the reel-in operation of the handle, and a pair of arms that rotate around the spool is mounted on the rotor. At the tips of the pair of arms, arm levers (bail supporting member) are supported in such a manner that they are capable of pivoting (flipping) between the reel-in position and the casting position, and a fishing line guide is mounted on one of the arm levers.
[0003]
The examples of the above-described fishing line guide include known configurations disclosed in Patent Literatures 1 and 2. The fishing line guides disclosed in these patent literatures comprise a bail and a line slider integrally formed of a plate or pipe material, and a support member for attaching a screw member is press-fitted into an open end of the line slider. In the fishing line guide of Patent Literature 1, the screw member is inserted from the line slider side, whereas that of the fishing line guide of Patent Literature 2 is inserted from the arm lever side.
[Prior Art Documents]
[Patent Literatures]
[0004]
[Patent Literature 1] Patent No. 3510465
[Patent Literature 2] Patent No. 3510466
[Summary]
[Technical Problem]
[0005]
In the fishing line guides disclosed in Patent Literatures 1 and 2, a separate support member is attached by press-fit into the open end of the line slider, and as this increases the weight of the fishing line guide, the rotation of the rotor becomes unbalanced, resulting in reduction in the fishing operability. Also, in the fishing line guide disclosed in Patent Literature 2, the screw member is inserted from the arm lever side, and thus, as

the fishing line gets tangled easily, the fishing operability is reduced.

[0006]

The present invention was created in consideration of the above-described problems, and an object thereof is to provide a spinning reel for fishing comprising a line slider that is as light as possible to achieve balanced rotation and improve the fishing operability.

[Solution to Problem]

[0007]

In order to achieve the above-mentioned object, the present invention is a spinning reel for fishing, comprising: a rotor that rotates in response to the rotation of a handle rotatably supported on a reel body; a spool that moves back and forth in response to the rotation of the handle; and a fishing line guide that is provided on one of arm levers pivotably supported on a pair of arms provided on the rotor and guides the fishing line to the spool; wherein the fishing line guide includes: a line roller that guides to the spool the fishing line picked up by a bail mounted on the pair of arms, and a line slider that guides the fishing line from the bail to the line roller; the line slider includes: a mounting portion on which the bail is integrally connected or formed and a wall portion that separates a first recess, which mounts a screw member for attaching the arm lever and houses at least a part of a head portion of the screw member, from a second recess which houses an end side of the line roller and covers the outer circumference of its edge with a tiny gap; and the wall portion and the line slider are formed of a single member.

[0008]

In the spinning reel for fishing of the above configuration, the line slider of the fishing line guide and the wall portion that separates the first recess from the second recess are formed of a single member, making the line slider as light as possible, and the fishing operability is improved. In addition, at least a part of the head portion of the screw member, for attaching the arm lever, of the fishing line guide is housed in the first recess on the opposite side of the second recess that houses the line roller, and thus, tangles of the line are effectively reduced, and the fishing operability is improved.

[Advantageous Effects]

[0009]

According to the spinning reel for fishing of the present invention, the weight of the line slider is reduced

as much as possible to achieve well-balanced rotation and improve the fishing operability.

[Brief Description of Drawing]

[0010]

[Fig. 1] Fig. 1 is a side view of an embodiment of a spinning reel for fishing of the present invention.

[Fig. 2] Fig. 2 is an enlarged view of a fishing line guide of the configuration shown in Fig. 1.

[Fig. 3] Fig. 3(a) is a perspective view of a line slider that constitutes the fishing line guide of Fig. 2, viewed from the side a screw member is inserted; and Fig. 3(b) is its perspective view viewed from an arm lever side.

[Fig. 4] Fig. 4(a) is a plan view of the line slider, and Fig. 4(b) is a sectional view along the line (b)-(b) in Fig. 4(a).

[Fig. 5] Fig. 5 is a sectional view of the configuration of the main part of the fishing line guide of Fig. 2.

[Description of Embodiments]

[0011]

Now, an embodiment of a spinning reel for fishing according to the present invention will be described. Figs. 1 and 2 show an embodiment of the spinning reel for fishing according to the present invention. Fig. 1 is a side view of the overall configuration, and Fig. 2 is an enlarged view of a fishing line guide of the spinning reel for fishing of Fig. 1.

[0012]

The spinning reel 1 for fishing comprises a reel body 2 that includes a hoot 2a to be mounted on a fishing rod. Inside the reel body, a handle shaft is rotatably supported by means of a bearing, and a handle 3 for the reel-in operation is mounted at an end of the handle shaft. To the handle shaft, a known driving force transmission mechanism is connected such that a rotor 5 rotates in response to the rotation of the handle 3, and a spool 4 moves back and forth by means of a known oscillating mechanism.

[0013]

On the rotor 5, a pair of arms 6 (only one of which is shown) extend in the axial direction substantially at intervals of 180°, facing each other, and the spool 4 is positioned between the pair of arms and reciprocates back and forth. At the tips of the arms 6, arm levers 7A, 7B are supported in such a manner that they pivot between a reel-in position and a casting position. To the arm levers 7A, 7B, the base ends of a semi-annular bail 8 are attached, and the bail 8 pivots with the arm levers 7A, 7B. Also, as Fig. 2 shows, a fishing line guide 10 is provided at the

tip of one of the arm levers, the arm lever 7B (on the opposite side of Fig. 1).

[0014]

As is known, the fishing line guide 10 includes a line roller 12 that guides the fishing line to the spool 4 and a line slider 14 that guides the fishing line from the bail 8 to the line roller 12, and the line slider 14 is connected to a base end 8a of the bail 8. Here, the bail 8 of this embodiment is hollow and integrally connected to a mounting portion 14a of the line slider 14, however, the bail 8 may be solid and integrally connected to the mounting portion 14a of the line slider 14, or may extend directly from the mounting portion 14a of the line slider 14 to be integrally formed with the line slider 14.

[0015]

Fig. 1 shows the reel-in state, and when the handle 3 is rotated in this state, the rotor 5 rotates by means of the driving force transmission mechanism, and the spool 4 reciprocates back and forth by means of the oscillating mechanism. As a result, the fishing line is evenly wound around a fishing line winding body 4a of the spool 4 by means of the line roller 12 of the fishing line guide 10 on the arm lever 7B, which rotates with the rotor 5.

[0016]

When the bail 8 is pivoted from the reel-in state shown in Fig. 1 to the casting position (pivoted in the direction of the arrow) in response to the pivoting of the arm levers 7A, 7B, the fishing line wound around the spool 4 will be in the casting state. Then, after the fishing line (hook) is cast in this casting state, when the bail 8 is pivoted from the casting position to the reel-in position, the fishing line is picked up by the bail 8 and guided by the line roller 12 along the line slider 14, ended in the reel-in state as shown in Fig. 1. The pivoting (return by flipping) of the bail 8 from the casting position to the reel-in position may be manually performed by holding the bail 8 with one hand, or may be performed by means of a known automatic return mechanism when the handle 3 is reeled in.

[0017]

Next, the configuration of the fishing line guide 10 will be described with reference to Figs. 3 to 5. As described above, the fishing line guide 10 includes the line roller 12 and the line slider 14, and the line roller 12 is cylindrical and rotatably supported between the arm lever 7B and the line slider 14. As described below, the line roller 12 of this embodiment is rotatably supported on a fixing member (screw member) 15 that fixes the line

slider 14 to the arm lever 7B, with a pair of bearings (rolling bearings) 17, 18 interposed.

[0018]

The line slider 14 is integrally formed of a metal material that is light and imparts good slidability, such as a thin stainless steel alloy sheet or aluminum alloy sheet, and includes an opening 14b that is formed in a substantially circular shape on the arm lever 7B side, and the mounting portion 14a that is connected to the base end of the bail 8 on the opposite side of the opening 14b. The mounting portion 14a includes an insertion opening 14c of a size that is sufficient to insert a connecting pipe 30 (see Fig. 5), which is fitted into and fixed to the base end 8a of the bail 8, and the line slider 14 and bail 8 are integrally connected by the connecting pipe 30 inserted into the insertion opening 14c and fixed by adhesion or the like.

[0019]

The line slider 14 includes a recess (first recess) 14A that houses at least a part of a head portion 15a of the fixing member 15. This first recess 14A is formed between a pair of inclined portions 14d that gradually widen and rise on both sides along the axial direction from the mounting portion 14a toward the arm lever side. The upper end side of the pair of inclined portions 14d on both sides of the first recess 14a is integrated with a ring-shaped annular portion 14e, forming the opening 14b on the arm lever side, whereas the lower end side of the pair of inclined portions 14d is integrated with the mounting portion 14a.

[0020]

The annular portion 14e has a certain length in the axial direction, and a wall portion 14f in the shape of a ring of a width is integrally formed on the bail side of its inner circumference surface. This wall portion 14f separates the first recess 14A from another recess (second recess) 14B that houses the end side of the line roller 12 inside the annular portion 14e. In the first recess 14A separated by this wall portion 14f, at least a part of the head portion 15a of the screw member 15 is housed, and the screw member 15 attaches the line slider 14 to the inner surface of the tip side of the arm lever 7B. In the second recess 14B, the end side of the line roller 12 is housed, and the outer circumference of its edge is covered by a tiny gap G between it and the inner circumference surface of the annular portion 14e.

[0021]

In the above-described configuration, the screw member 15 is inserted from the bail side, and the bearings 17, 18 are provided at a middle part of its shaft portion 15b, with a male screw 15c formed at the end of the shaft portion 15b to be screwed into and fixed to a female screw 7b formed on an inner surface 7a of the arm lever 7B. Thus, the first recess 14A and the second recess 14B communicate with each other with the wall portion 14f as the boundary, and the wall portion 14f includes an opening 14g for the shaft portion 15b of the screw member 15 to be inserted.

[0022]

The bearings 17, 18 are supported on the shaft portion 15b in such a manner that their movement in the axial direction is restricted so that they are positioned when supported. For example, the line roller 12 includes an annular projection 12a formed on the inner circumference of its center portion, and ring-shaped restriction members 19, 20 are pressed against the annular projection 12a from both sides of the axial direction. The restriction members 19, 20 include flanges 19a, 20a at their ends respectively, and with the bearings 17, 18 pressed against this part, the outer ring side of the bearings 17, 18 is positioned in the axial direction. At outside, with respect to the axial direction, of the inner ring side of the bearings 17, 18, spacers 21, 22 are interposed respectively between the bearing 17 and the wall portion 14f and between the bearing 18 and the female screw 7b formed on the arm lever 7B, for positioning in the axial direction, and a spacer 23 for positioning is also interposed between the inner rings of both bearings. A protection member 25 that is waterproof and sandproof may be provided between the spacer 22 and the arm lever 7B.

[0023]

As a result, the fishing line guide 10 is attached to the arm lever 7B: with the screw member 15 inserted into the wall portion 14f from the bail side with washers 27, 28 interposed on both sides of the wall portion 14f; the spacer 21, the bearing 17, the restriction member 19, and the line roller 12 assembled on the shaft portion 15b; and the screw member 15 fixed to arm lever 7B with the spacer 23, the bearing 18, the restriction member 20, the spacer 22, and the protection member 25 assembled.

[0024]

In the above-described fishing line guide 10, the line slider 14 includes the wall portion 14f that is integrally formed and separates the first recess 14A from the second recess 14B, and thus, there is no need to press-fit a separate support member into the open end on the arm lever

side, as is the case of the conventional art. In other words, since the wall portion 14f and the line slider 14 are formed of a single member, the weight of the line slider part is reduced, and the rotation of the rotor is well-balanced, resulting in improvement in the fishing operability. Further, the fishing line guide 10 is attached to the arm lever 7B in such a manner that the screw member 15 is inserted from the bail 8 side, and at least a part of the head portion 15a of the screw member 15 is housed in the first recess 14A of the line slider 14, and thus, the surfaces on the arm lever side are flush without the screw member being exposed, which reduces tangles of the fishing line. Also, since the head portion 15a is provided inside the inclined portions 14d, tangles of the fishing line inside the line slider 14 are also prevented.

[0025]

In other words, the line slider 14 described above provides a configuration that is as light as possible and allows for integrating the bail 8 with the arm lever 7B, housing the head portion of the screw member 15 and the end side of the line roller 12 in the first recess 14A and the second recess 14B separated by the wall portion 14f, and guiding the fishing line picked up by the bail 8 to the line roller 12.

[0026]

The first recess 14A and the second recess 14B communicate with each other by means of the wall portion 14f with the opening 14g, and the screw member 15 is inserted there to support the bearings 17, 18 on its shaft portion 15b, with the end side of the line roller 12 housed in the second recess 14B, and as a result, the size of the fishing line guide 10 is reduced making it as light as possible, and the fishing operability is improved further.

[0027]

In this embodiment, the mounting portion 14a of the line slider 14 is more lightweight as it is hollow at the part that is connected to the base end of the bail, and furthermore, the first recess 14A and the hollow mounting portion 14a are separated by a plate portion 14h with the wall portion 14f integrated on the arm lever side of the plate 14h. In other words, the first recess 14A is separated from the mounting portion 14a by a curved bottom (the plate portion 14h), and thus, seawater, foreign matter, etc. do not enter the mounting portion 14a from the first recess 14A side. Also, even when the bale 8 is hollow, seawater, foreign matter, etc. do not enter the bale.

[0028]

The hollow mounting portion 14a may communicate with the first recess 14A and the second recess 14B (with no bottom provided), to allow for further reduction in the weight of the line slider.

[0029]

The above-described line slider 14 may be integrally formed of a base material such as a plate or pipe material through multiple processes such as press molding and cutting, or of a resin or metal material by using a mold, with no limitation on the materials or the production methods, and the line slider 14 and the bail 8 may be integrally formed.

[0030]

Also, the structure to connect the line slider 14 and the bail is not limited to any specific one. For example, as Fig. 5 shows, a connecting pipe 30 with a center flange 31 may be press-fitted into the mounting portion 14a of the line slider 14 and the base end 8a of the bail 8, where both members are pressed against the center flange 31, and the mounting portion 14a and the base end 8a are fixed to the connecting pipe 30 by adhesion or the like, with the center flange 31 being polished to make the two members flush with each other with no bumps.

[0031]

Although an embodiment of the present invention is described here, the present invention is not limited to the above-described configuration and may be modified in various manners. The present invention is characterized by the part of the line slider 14 that constitutes the fishing line guide 10, and its other configurations are not limited to those of the above-described embodiment, and may be modified in various manners. For example, the shape, material, etc. of the outer circumference surface of the line roller 12 may be freely determined, and the bearings 17, 18 that support the line roller 12 may be desirably modified to be, e.g., a cylindrical collar member integrally formed of synthetic resin or the like.

[0032]

The wall portion 14f of the line slider 14 only needs to be integrally formed with the line slider with the same material and separate the first recess 14A from the second recess 14B, and the wall portion 14f for separation may include a projection to support the bearings. Furthermore, the external shape of the line slider 14 may be desirably modified.

[Explanation of Reference Numerals]

[0033]

1 Spinning reel for fishing

2 Reel body
3 Handle
4 Spool
5 Rotor
7A, 7B Arm levers
10 Fishing line guide
12 Line roller
14 Line Slider
14A First recess
14B Second recess
14f Wall portion
15 Screw member

[Document Name] Claims

[Claim 1]
A fishing spinning reel comprising:
a rotor configured to rotate by rotation operation of a handle rotatably supported by a reel main body;
a spool configured to move back and forth by the rotation operation of the handle; and
a fishing line guide disposed on one of arm levers pivotably supported by a pair of arms provided on the rotor to guide a fishing line to the spool,
wherein the fishing line guide includes:
a line roller configured to guide the fishing line picked up by a bail attached to the pair of arms to the spool; and
a line slider configured to guide the fishing line from the bail to the line roller;
wherein the line slider includes:
an attachment part that the bail is integrally joined to or formed with;
a first depression configured to accommodate at least a part of a head of a screw member when the screw member is attached, wherein the screw member is inserted from a bail side and the screw member is configured to fasten the line slider to one of the arm levers;
a second depression configured to accommodate an end of the line roller and covering to cover an outer periphery of the end with a minute gap provided; and
a wall configured to separate the first depression from the second depression, wherein the wall and the line slider are formed of a single member; and
wherein the first depression and the second depression are formed to communicate with each other by a circular opening in the wall, wherein the circular opening is provided with a recess.

[Claim 2]
The fishing spinning reel according to claim 1, wherein the attachment part is formed into a hollow structure, the first depression and the attachment part having a hollow structure are separated by a plate-shaped part, and the wall is integrated with the plate-shaped part.

[Claim 3]
The fishing spinning reel according to claim 1, wherein the attachment part is formed into a hollow

structure and communicates with the first depression and the second depression.