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(54) **A CARRIAGE FOR WINDING A TUBE**

(57) A carriage for winding a flexible tube, comprising: a support frame (3) provided with wheels (4) for resting and rolling on the ground surface (G); a profiled roller (6), rotatably associated to the frame (3) for enabling winding and unwinding of a flexible tube; a rest foot (5), inferiorly associated to the frame (3) so as to define, together with the wheels (4), a first rest perimeter of the carriage on the ground surface; a handle (2), superiorly associated to the frame (3) and mobile between a raised configuration, in which the handle (2) is at a higher level than the roller (6), and a lowered configuration, in which it is at a lower level than the roller (6).

The handle (2) comprises a pair of stems (20), slidably associated to the frame (3), each of which is provided with a lower end (21); the stems (20) are configured so that in the lowered position of the handle (2), the lower ends (21) protrude from the frame (3) below the wheels (4), so as to define a second rest perimeter on the ground surface, together with the rest foot (5), with respect to which the wheels (4) are raised.

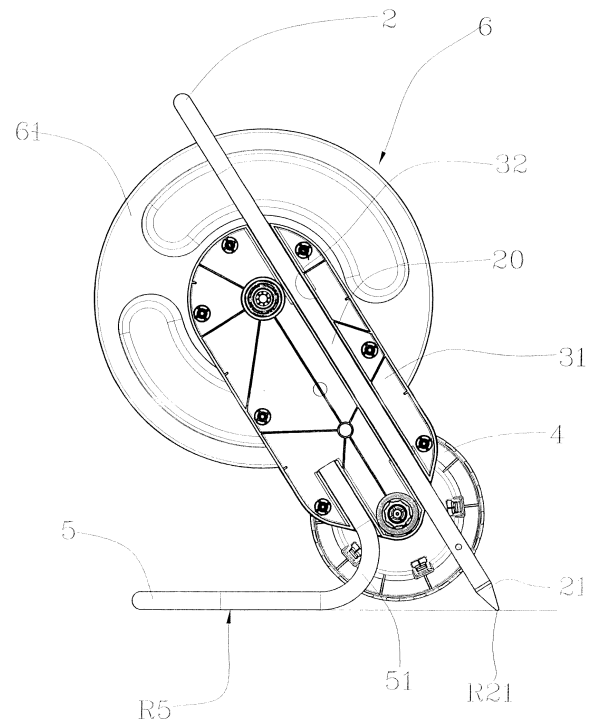


Fig.5

Description

[0001] The present invention relates to a carriage for winding a tube.

[0002] The invention relates in particular to a carriage comprising a support frame provided with wheels for resting and sliding on the ground surface. The carriage further comprises a profiled roller, associated to the support frame, structured to enable the winding of a flexible tube. The frame further comprises a rest foot, arranged in a staggered position with respect to the wheels, and a handle for drawing the carriage.

[0003] The rest foot is configured to be arranged resting on the ground surface in a stable position of the carriage, in which the overall centre of gravity of the carriage, comprising the tube wound on the profiled roller, lies within the perimeter defined by the wheels and the rest foot.

[0004] A typical example of use of a carriage of the above-described type is for conservation and displacement of a flexible tube for irrigation, for example for gardening and small cultivations. The tube is normally conveyed, by means of the carriage, in the use position in a rolled configuration on the roller. In the use position, the tube is connected to a tap, by an appropriate connection associated to the roller, and is then unreeled by pulling the free end thereof.

[0005] During this unreeling step, the carriage tilts rather frequently, as the configuration of the rest foot does not guarantee a sufficient stability of the carriage. The tilting of the carriage, obviously, prevents the tube from unreeling in the desired way. If it does not tilt, the carriage, in any case, tends to be drawn by the tube, moving on its wheels.

[0006] The aim of the present invention is to provide a carriage for winding a tube which enables obviating the drawbacks of the currently available carriages.

[0007] Characteristics and advantages of the present invention will more fully emerge from the following detailed description of an embodiment of the invention, as illustrated in a non-limiting example in the accompanying figures, in which:

- figure 1 shows an isometric view of a carriage according to the present invention;
- figures 2, 3 and 4 show three different operating configurations of the carriage according to the present invention in a lateral view;
- figure 5 shows the carriage of figure 5, with some parts removed.

[0008] The carriage according to the present invention comprises a support frame (3) provided with wheels (4) for resting and rolling on the ground surface (G). In the illustrated embodiment, the frame (3) comprises a pair of shoulders (31), to each of which a wheel (4) is associated. The wheels (4) are arranged at a lower end of the shoulders (31).

[0009] The wheels (4) are preferably, but not neces-

sarily, rotatable about a common rotation axis (X). As well as being connected to the shoulders (31), the wheels (4) can be connected to one another by means of a shaft, which is not visible in the appended figures, concentric to the rotation axis (X).

[0010] The carriage is further provided with a profiled roller (6), rotatably associated to the frame (3) for enabling winding and unwinding of a flexible tube. The roller (6) is arranged above the wheels (4).

[0011] In the illustrated embodiment, the roller (6) has two lateral shoulders (61) having a larger diameter than a central portion, which is not visible in the appended figures. The roller (6) is located between the shoulders (31) of the frame (3) and is associated rotatably thereto about the rotation axis which, preferably, is parallel to the rotation axis (X) of the wheels (4). The carriage can be provided with a crank (H), solidly constrained to the roller (6) in rotation about the same rotation axis of the roller (6) with respect to the frame (3). The crank (H) can be associated to a shoulder (31), on the opposite side with respect to the roller (6), rotatably about the rotation axis of the roller (6).

[0012] As known to those skilled in the art, the roller (6) is provided with an internal conduit structured to enable the connection between the flexible tube and a water source, for example a tap or a pump. The internal conduit, which is not illustrated in detail, comprises a first connection, structured for enabling the connection with an end of the flexible tube, and a second connection, structured to enable connection to a water source. The second connection preferably protrudes from the roller (6) along a direction that is concentric to the rotation axis of the roller (6), across one of the shoulders (31) of the frame (3).

[0013] The carriage further comprises a rest foot (5), associated inferiorly to the frame (3). The rest foot (5) is configured so as to define, together with the wheels (4), a first rest perimeter of the carriage on the ground surface. In substance the carriage, according to the present invention, in a rest configuration, rests on the ground surface on the wheels (4) and the foot (5). The contact points or zones (R4) of the wheels (4) with the ground surface (G) and the contact points or zones (R5) of the foot (5) with the ground surface (G) define the vertices of a perimeter within which the overall centre of gravity of the carriage falls. In the rest configuration illustrated in figures 1 and 2, the projection to the ground surface of the rotation axis of the roller (6) is preferably in an intermediate position between a line that conjoins the rest zones on the ground surface of the wheels (4) and the contact point or zone with the ground surface of the rest foot (5).

[0014] A handle (2) is superiorly associated to the frame (3). The handle (2) is mobile between a raised configuration (figures 1 and 2), in which it is at a higher level than the roller (6), and a lowered configuration (figures 4 and 5), in which it is at a lower level than the roller (6). For this purpose, the handle (2) comprises a pair of stems (20), slidably associated to the frame (3). In particular, each shoulder (31) of the frame (3) is provided

with a seating (32) for slidably housing a stem (20) of the handle (2). The stems (20) are preferably parallel to one another and are slidable on planes that are perpendicular to the rotation axis (X).

[0015] In the raised position, illustrated in figures 1 and 2, the handle (2) facilitates the drawing of the carriage for the displacement of the tube wound on the roller (6). By gripping the handle (2) it is in fact possible to rotate the frame (3) about the rotation axis of the wheels (4), so as to raise the rest foot (5) (in figure 2, a rotation of the frame (3) in a clockwise direction raises the foot (5) from the ground surface). In these conditions the frame (3) rests only on the wheels (4) and can easily be drawn.

[0016] Each stem (20) is advantageously provided with a lower end (21), facing towards the ground surface (G). The stems (20) are configured so that in the lowered position of the handle (2), the lower ends (21) protrude from the frame (3) below the wheels (4), so as to define a second rest perimeter on the ground surface, together with the rest foot (5), with respect to which the wheels (4) are raised. Moving towards the lowered position of the handle (2), the lower ends (21) enter first into contact with the ground surface (G) at the respective contact points or zones (R21) (figure 3). Thereafter, by moving the handle (2) into the lowered position, it is possible to raise the wheels (4) (figures 4 and 5). In the illustrated embodiment, each seating (32) is in the form of an open channel at both ends, in order to enable the exit of the lower end (21) of the relative stem (20).

[0017] The possibility of the stems (20) to protrude from below the frame (3) in order to bring the lower ends (21) into contact with the ground surface, by raising the wheels (4) from the ground surface, enables defining, together with the foot (5), a second rest perimeter. The second rest perimeter can be conformed in such a way as to increase the stability of the carriage during the unreeling of the tube. With reference to figures 4 and 5, if the unreeling is done by pulling the tube in a rightwards direction with a force (F), the lower ends (21), in the lowered position of the handle, raise the wheels (4), so that the carriage opposes the force (F) by resting on the lower ends (21) without being able to move on the wheels (4).

[0018] In the illustrated embodiment, the wheels (4) are rotatable about a rotation axis (X) the projection of which on the ground surface (G) is in an intermediate position between the contact zones (R21) with the ground surface of the lower ends (21) and the contact zones (R5) with the ground surface of the rest foot (5). In other terms, the contact zones with the ground surface of the lower ends (21) are located at a greater distance from the contact zone with the ground surface of the rest foot (5) with respect to the wheels (4). This enables further improving the stability of the carriage. The lower ends (21) are preferably, but not necessarily, aligned along a line that is substantially parallel to the rotation axis (X).

[0019] The rest foot (5) preferably has a profiled member shape comprising a transversal portion (50) and two longitudinal arms (51), connected to the ends of the trans-

versal portion (50). The two longitudinal arms (51), at the opposite end with respect to the transversal portion (50), are connected to the shoulders (31). The transversal portion (50) and the longitudinal arms (51) are reciprocally coplanar and are configured so as to be arranged in contact with the ground surface in the lowered position of the handle (2). In other terms, in the lowered position of the handle (2), in which the lower ends (21) are in contact with the ground surface and the wheels (4) are raised from the ground surface, the rest foot (5) enters into contact with the ground surface in a zone (R5) that comprises the transversal portion (50) and the longitudinal arms (51). The contact of the rest foot (5) with the ground surface is thus very stable, especially in the lowered position of the handle (2).

Claims

1. A carriage for winding a flexible tube, comprising a support frame (3) provided with wheels (4) for resting and rolling on the ground surface (G); a profiled roller (6), rotatably associated to the frame (3) for enabling winding and unwinding of a flexible tube; a rest foot (5), associated inferiorly to the frame (3) so as to define, together with the wheels (4), a first rest perimeter of the carriage on the ground surface; a handle (2), superiorly associated to the frame (3) and mobile between a raised configuration, in which the handle (2) is at a higher level than the roller (6), and a lowered configuration, in which it is at a lower level than the roller (6); **characterised in that:** the handle (2) comprises a pair of stems (20), slidably associated to the frame (3), each of which is provided with a lower end (21); the stems (20) are configured so that in the lowered position of the handle (2), the lower ends (21) project from the frame (3) below the wheels (4), so as to define a second rest perimeter of the carriage on the ground surface, together with the rest foot (5), with respect to which the wheels (4) are raised.
2. The carriage according to claim 1, wherein the wheels (4) are rotatable about a rotation axis (X), and wherein the projection of the rotation axis (X) on the ground surface (G) is in an intermediate position between the contact zones with the ground surface of the lower ends (21) and the rest foot (5).
3. The carriage according to claim 1, wherein the wheels (4) are rotatable about a rotation axis (X), and wherein the lower ends (21) are aligned along a line that is substantially parallel to the rotation axis (X).
4. The carriage according to claim 1, wherein the support frame (3) comprises a pair of shoulders (31), each of which is provided with a seating (32) for sl-

idably housing a stem (20) of the handle (2).

5. The carriage according to claims 3 or 4, wherein the rest foot (5) is shaped as a bar (5) connected to the shoulders (31) by means of two arms (51), and wherein the rest foot (5) is substantially parallel to the line joining the lower ends (21). 5
6. The carriage according to claims 3 or 4, wherein the rest foot (5) has a profiled member shape comprising a transversal portion (50) and two longitudinal arms (51), connected to the ends of the transversal portion (50) and to the shoulders (31). 10
7. The carriage according to claim 6, wherein the transversal portion (50) and the longitudinal arms (51) are reciprocally coplanar and are configured so as to be arranged in contact with the ground surface in the lowered position of the handle (2). 15

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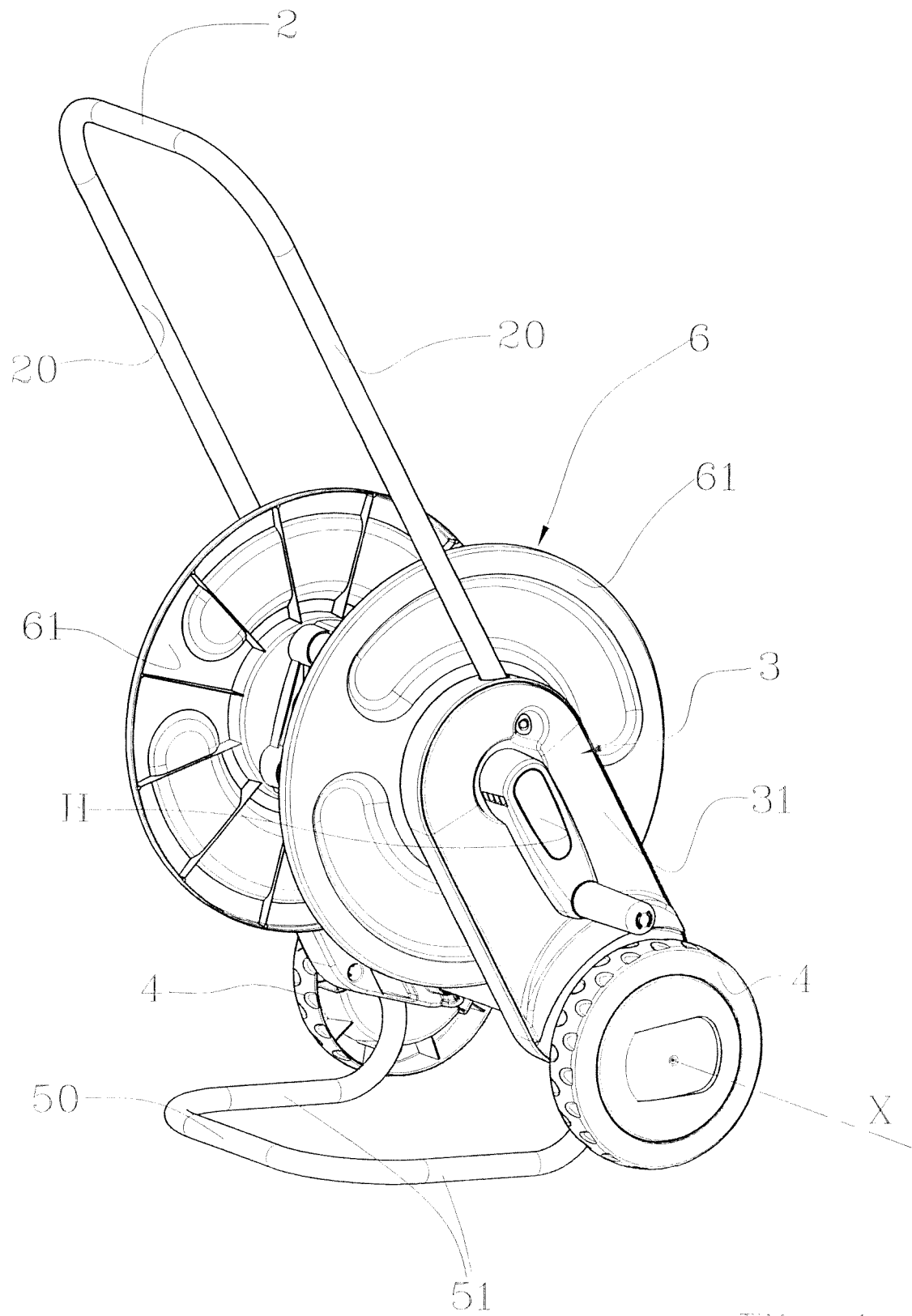


Fig.1

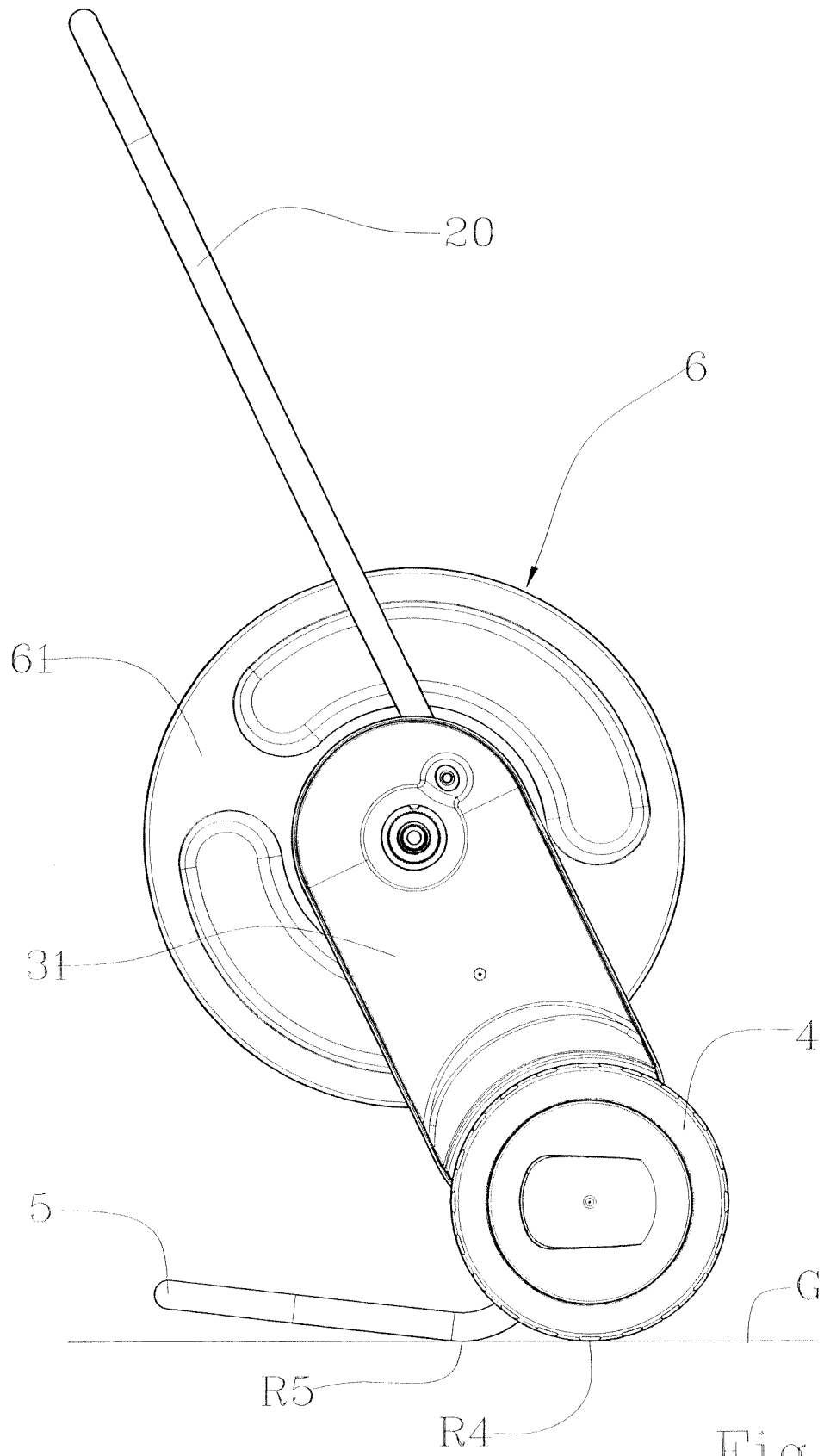


Fig. 2

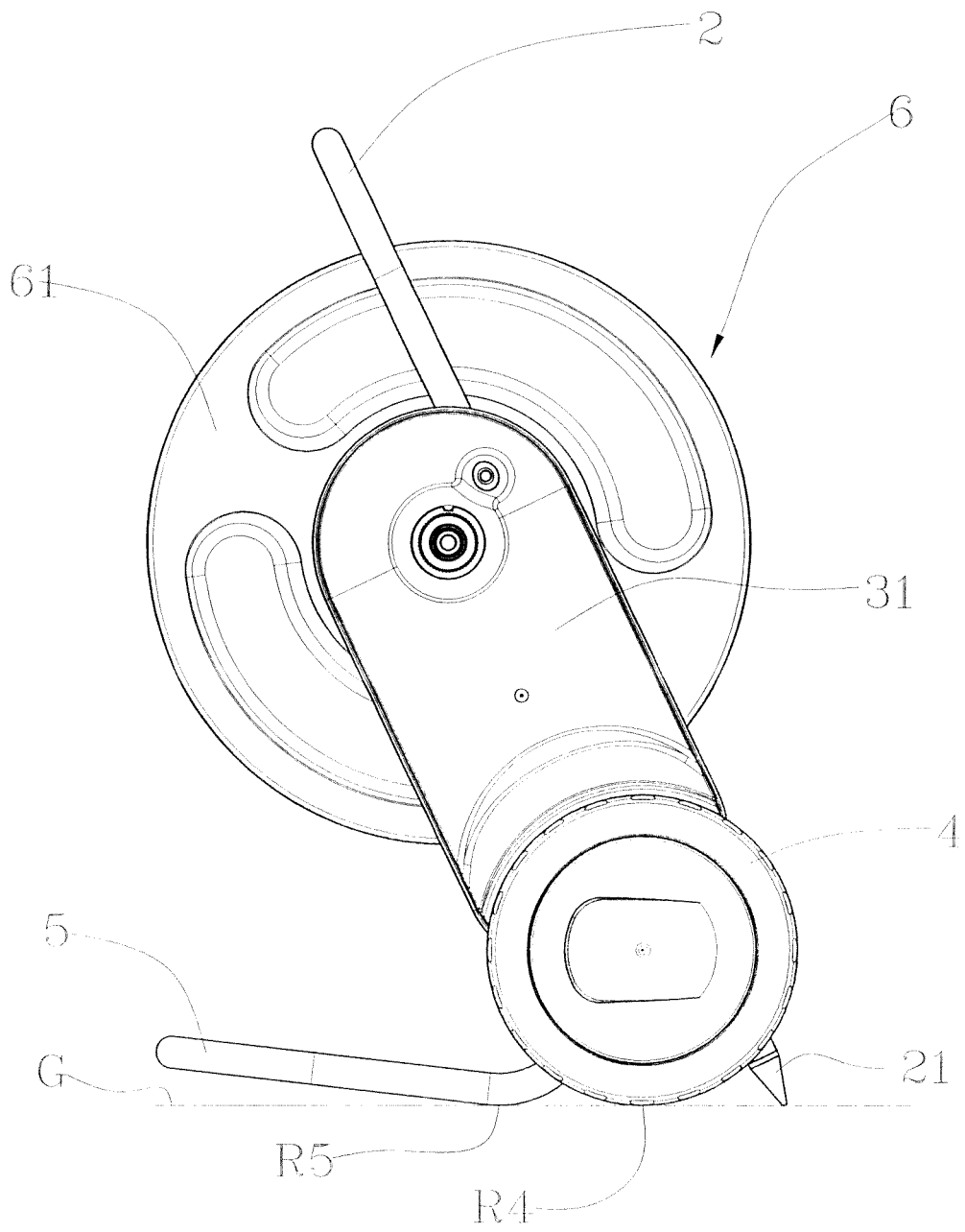


Fig.3

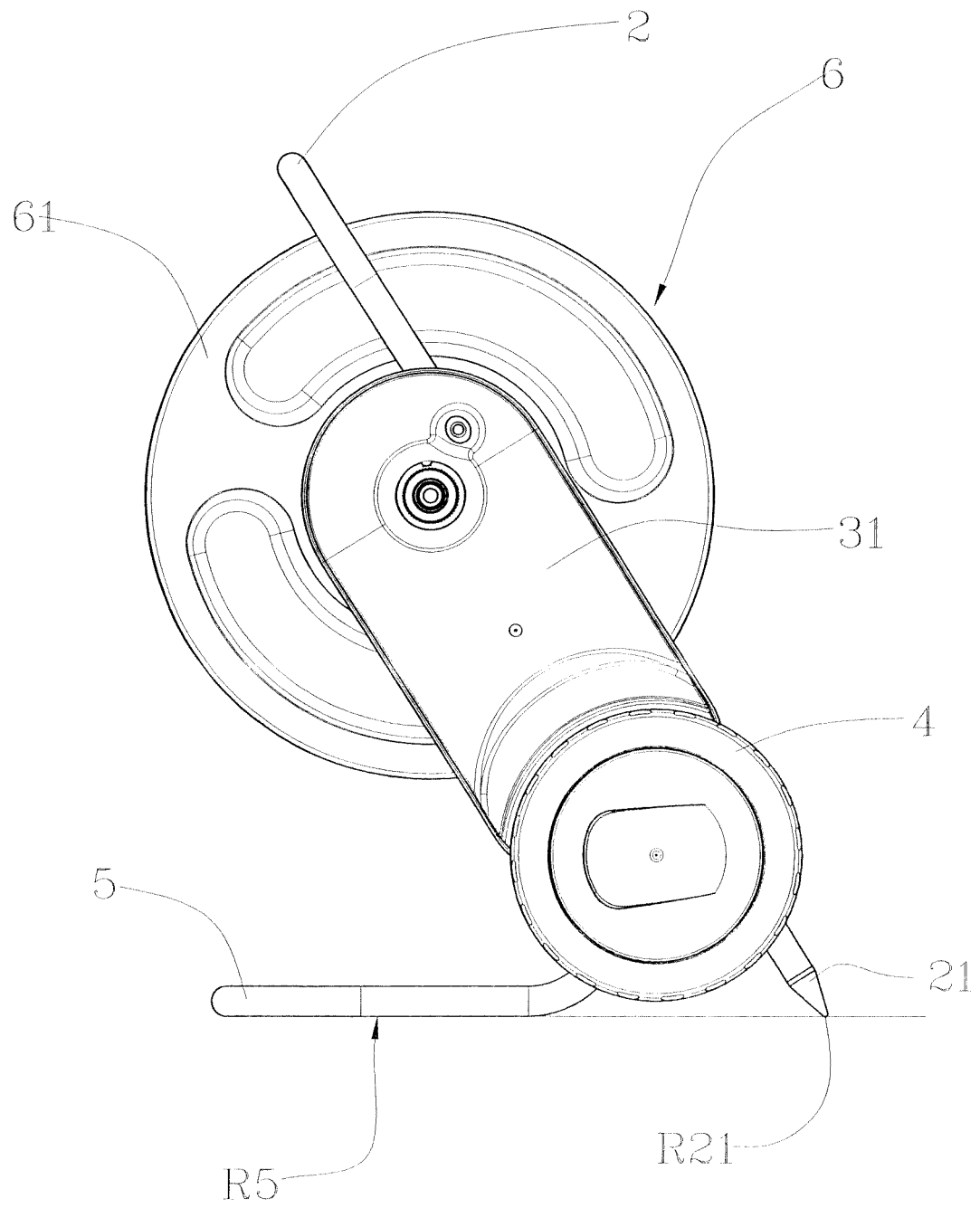


Fig. 4

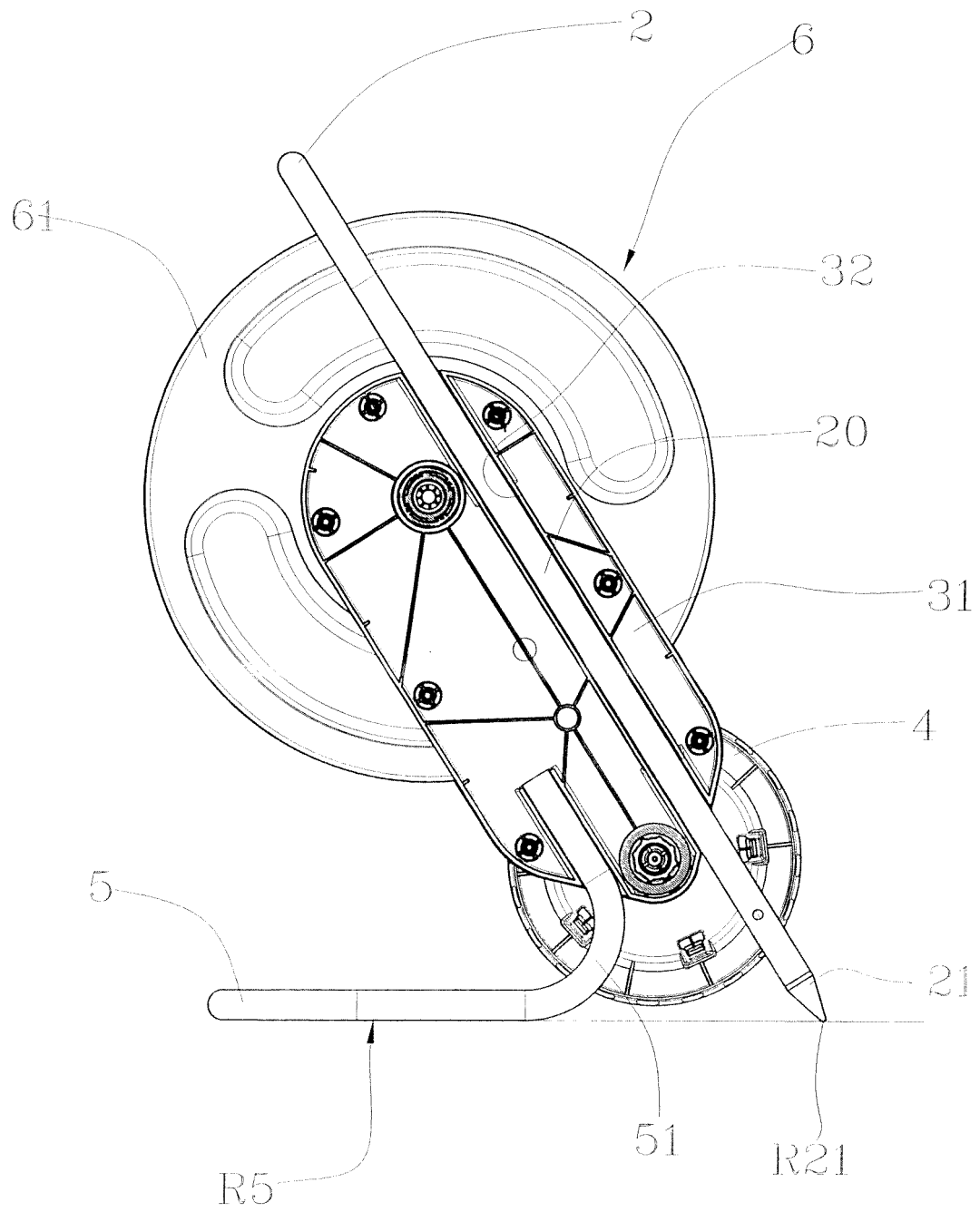


Fig.5



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Application Number
EP 18 19 6161

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The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 30 January 2019	Examiner Pussemier, Bart
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	

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**ANNEX TO THE EUROPEAN SEARCH REPORT
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