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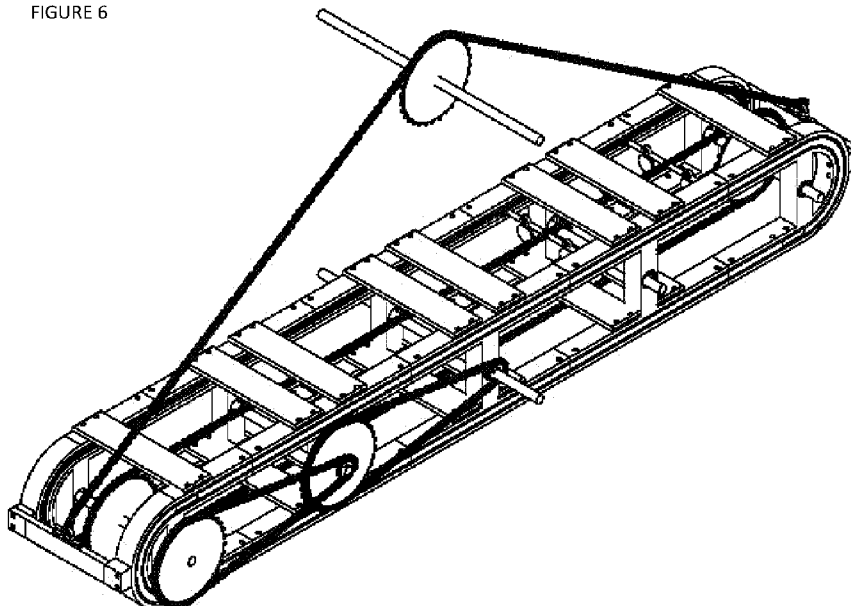
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(54) Title: GRAVITATIONAL MECHANICAL ENERGY GENERATOR

FIGURE 6



(57) Abstract: A gravitational mechanical energy generator that utilises the force of gravity enacting on hanging objects of suitable density and mass for the force of gravity to enact strongly enough with a pulling force down a slope to deliver mechanical energy, combined with timed part rotation in either a clockwise or anti-clockwise direction to generate continuous movement. A singular rounded rectangular path may be provided for the hanging objects, or multiple downward slopes and / or spirals as the design may require.



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- *in black and white; the international application as filed contained color or greyscale and is available for download from PATENTSCOPE*

TITLE

GRAVITATIONAL MECHANICAL ENERGY GENERATOR

FIELD OF THE INVENTION

The present invention relates to a renewable energy device utilising the force of gravity on hanging objects to generate mechanical energy.

BACKGROUND

Various methods of utilising natural resources to generate electricity without a carbon footprint has been developed to date. However, these methods are reliant on external natural factors for operation, which limits continuous reliable energy delivery. Many of these devices only acts as energy delivery supplementation and very seldom can produce enough energy to allow residential or commercial premises to be fully powered by the renewable energy device. Although generation capacity may be increased by larger operational devices, these are not normally suitable for location based installation.

Solar generation is dependent on clear skies for continuous radiant energy of the sun to be converted into heat and electricity, and have a limited operation window for generation, restricted to daytime operation only. Natural factors such as cloud cover adversely impacts the energy generation capacity. To generate vast amounts of energy it relies on large areas to be allocated for installation and operation. Installation costs remain high, and although solar panels are portable, it is not a preferred. Solar panels are also not suitable for all residential or commercial property designs.

Wind power generators are reliant on air currents to provide mechanical energy for energy generation, however various factors impact energy delivery potential. Where air currents may be too light or inconsistent, generation capacity is adversely impacted, and strong air currents pose a potential danger to the generators. Wind power generators with sufficient capacity are manufactured as large structures and mainly installed in sparsely occupied residential areas or remote outlying areas. Although wind turbines may be produced in many generation capacities, generally they are not of sufficient size to provide constant reliable energy generation to power residential or commercial properties.

Hydro power generators relies on water movement, and natural factors such as droughts will adversely affect the generators with limited energy generation capacity. Large water movement such as floods could also potentially adversely affect operation. Hydro power

generators are also not suitable for on-site installation due to the location of residential or commercial properties.

Although gravity has been used to some extent, it has mainly been used as an energy storage.

Therefore, the need exists for a reliable renewable energy generator that is not reliant on variable natural resources to deliver continuous reliable energy generation.

BRIEF SUMMARY OF THE INVENTION

Gravitational mechanical energy generator

The present invention details a gravitational mechanical energy generator that utilises the force of gravity enacting on hanging objects of suitable density and mass for the force of gravity to enact strongly enough with a pulling force down a slope to deliver mechanical energy.

This mechanical energy can produce rotational movement to a device such as a magnetic generator.

The design may be limited to a single rotational track or contain multiple downward slopes and / or spirals as the design may require.

For continuous movement and delivery of mechanical energy, part rotational movement of the device in either a clockwise or anti-clockwise direction is applied at timed intervals, enabling the hanging objects to travel around such rounded corners, this can be done either manually or by way of an electric motor type.

BRIEF DESCRIPTION OF DRAWINGS

FIGURE 1 (a) and (b) – Figure 1 (a) illustrates the completed assembly of a gravity enabler, and Figure 1 (b) details the individual parts of a gravity enabler

FIGURE 2 (a) and (b) – Figure 2 (a) illustrates the completed assembly of the rotational support, and Figure 2 (b) details the individual parts of the rotational support

FIGURE 3 (a) and (b) – Figure 3 (a) illustrates the completed assembly of the rounded rectangular track, and Figure 3 (b) details the individual parts of the rounded rectangular track

FIGURE 4 (a) and (b) – Figure 4 (a) illustrates the completed assembly of the internal cable system, and Figure 4 (b) details the individual parts of the internal cable system

FIGURE 5 (a) and (b) – Figure 5 (a) illustrates the completed assembly of the increased rotational conversion system, and Figure 5 (b) details the individual parts of the increased rotational conversion system

FIGURE 6 – Figure 6 illustrates the completed assembly of the system

FIGURE 7 – Figure 7 illustrates the concept of the device movement to deliver continuous energy generation

DETAILED DESCRIPTION OF THE INVENTION

The terminology used herein is for the purpose of describing particular embodiments only and is not intended to be limiting of the invention. As used herein, the term “and / or” includes any and all combinations of one or more associated listed items. As used herein, the singular forms “a”, “an” and “the” are intended to include the plural forms as well as the singular forms, unless the context clearly indicates otherwise. It will be further understood that that the terms “illustrates” and/or “details” when used in this specification, specify the presence of stated features, steps, operations, elements and / or components, but do not preclude the presence or addition of one or more other features, steps, operations, elements, components and / or groups thereof.

Unless otherwise defined, all terms (including technical and scientific terms) used herein have the same meaning as commonly understood by one having ordinary skill in the art to which this invention belongs. It will be further understood that terms, such as those defined in commonly used dictionaries, should be interpreted as having a meaning that is consistent with their meaning in the context of the relevant art and the present disclosure and will not be interpreted in an idealized or overly formal sense unless expressly so defined herein.

In describing the invention, it will be understood that a number of techniques and steps are disclosed. Each of these have individual benefit and each can also be used in conjunction with one or more, or in some cases all, of the other disclosed techniques. Accordingly, for the sake of clarity, the description will refrain from repeating every possible combination of the individual steps in an unnecessary fashion. Nevertheless, the specification and claims should be read with the understanding that such combinations are entirely within the scope of the invention and the claims.

In the following description, for purposes of explanation, numerous specific details are set forth in order to provide a thorough understanding of the present invention. It will be evident,

however, to one skilled in the art that the present invention may be practiced without these specific details.

The present disclosure is to be considered as an exemplification of the invention and is not intended to limit the invention to the specific embodiments illustrated by the figures or description below.

1 GRAVITY ENABLERS

FIGURE 1 (a) details the gravity enablers, on which to connect hanging objects of specified density and mass to enact the force of gravity.

FIGURE 1 (b) details the individual parts of a gravity enabler.

Each gravity enabler is supported by a central rod (1), connected to a cable (2). 2 further connectors (3) are attached on each side to secure the cable (2) in the centre of the central rod (1) and provides a centre opening (4) to which a clip (5) and objects of a specified density and weight (6) can be hanged.

The central rod (1) is connected to a flange wheel (7) on either side, which is connected to the gravity enabler wheels (8). Depending on the power requirement of the device, one or more gravity enablers may be attached at intervals to the cable (2).

FIGURE 1 (b) illustrates all the aforementioned parts assembled as a completed gravity enabler.

2 MECHANICAL ENERGY CONVERSION DEVICE

2.1 ROTATIONAL SUPPORT SYSTEM

FIGURE 2 (a) illustrates the rotational support system, which will allow the device to be rotated in either a clockwise or anti-clockwise direction manually or driven by a motor as example.

FIGURE 2(b) details the individual parts of the rotational support system.

It comprises of a central sprocket (1), hosted on a rod (2) which support a cable (3). A carabiner clip (4) is attached to either end of the cable (2) which attaches to the main track.

As example, a motor/s capable of providing forward or reverse rotational motion, or any other device capable of creating timed opposing directional movement is attached to the rod

(2). This enable the track to be rotated in either a clockwise or anti-clockwise direction, depending on the required movement.

2.2 ROUNDED RECTANGULAR TRACK

FIGURE 3 (a) illustrates all the components of the rounded rectangular track assembled, which will allow a path for the gravity enablers to travel in a continuous movement.

FIGURE 3 (b) details the track which is divided in the left-hand side (1) and the right-hand side (2), in a rounded rectangular shape. The two sides mirror each other.

The track is stabilised with top track stabilisers (3) and bottom track stabilisers (4), connecting the left-hand side (1) and right-hand side (1) to ensure an equal distance between the track left hand side (1) and right-hand side (2) is maintained across the length of the track.

The track has a central groove (5) for the gravity enabler wheels to run in and provide a singular rounded rectangular path around the track.

The track provides openings (6) for ball bearings (7).

Two track end connectors (8) are attached on the left-hand end and right-hand end side of the track to provide further stability to the system and ensure an equal distance between the left-hand side (1) and right-hand side (2) is maintained.

2.3 INTERNAL CABLE SYSTEM

FIGURE 4 (a) illustrates the internal cable system assembled.

FIGURE 4 (b) details the individual components of the internal cable system.

A sprocket (1) is attached to the centre of a rod (2) on the left-hand side of the track and a sprocket (3) is attached to the centre of a rod (4) on the right-hand side of the track, to provide support for the cable (5) to run in centrally between the left-hand and right-hand side of the track. One or more gravity enablers (6) may be attached to the cable (5).

The left-hand rod (2) provides a rotational output for the gravitational mechanical energy generated.

A further central rod (7) is attached to the track as a support and will allow the track to be freely rotated centrally in either a clockwise or anti-clockwise direction.

FIGURE 5 illustrates all of the aforementioned parts assembled as a completed device.

2.4 INCREASED ROTATIONAL CONVERSION SYSTEM

FIGURE 5 (a) illustrates the method of increasing the final rotational output speed.

FIGURE 5 (b) details the individual components of the increased rotational conversion system.

A larger sprocket (1) is connected to the left-hand rod (2). The larger sprocket (1) is connected to a smaller sprocket (4) with a cable (3). The smaller sprocket (4) and a larger sprocket (6) is connected to a rod (5). The larger sprocket (6) is connected to the smaller sprocket (8) by a cable (7). The smaller sprocket (8) is connected to the system centre rod (9).

A magnetic generator may be attached to the rod (9) which is driven by the rotation movement of the small sprocket (8).

2.5 SYSTEM

Figure 6 depicts all components connected.

FIGURE 7 illustrates the proposed rotational movement of the device.

Figure 7 (a) illustrates a clockwise rotation of the left-hand side allowing the hanging objects to travel freely downwards from left to right across the track

Figure 7 (b) illustrates an anti-clockwise rotation of the right-hand side allowing the hanging objects to travel around the circumference of the rounded corner and continue to travel freely downwards from right to left across the track

Figure 7 (c) illustrates a clockwise rotation of the left-hand side allowing the hanging objects to travel around the circumference of the rounded corner and continue to travel freely downwards from left to right across the track

Figure 7 (b) illustrates an anti-clockwise rotation of the right-hand side allowing the hanging objects to travel around the circumference of the rounded corner and continue to travel freely downwards from right to left across the track

CLAIMS

1. I hereby claim to have invented a device utilising the force of gravity enacting on hanging objects of specified density and mass down a slope to provide mechanical energy to rotate as example a magnetic generator to induce a voltage which can be used to charge a battery system.
2. I also claim that by applying part rotational movement of the device at the required intervals the motion of the hanging objects will be continuous to deliver uninterrupted gravitational mechanical energy.

AMENDED CLAIMS
received by the International Bureau on
24 May 2024 (24.05.2024)

CLAIMS

I hereby claim to have invented:

Claim 1:

1. A gravitational mechanical energy generator comprising:
 - i. a double-sided rounded rectangular track;
 - ii. a plurality of gravity enablers configured to move along the track, each gravity enabler comprising hanging objects of specified density and mass;
 - iii. a rotational support system configured to enable the track to rotate in either a clockwise or anti-clockwise direction at timed intervals;
 - iv. a mechanical energy conversion device configured to convert the movement of the gravity enablers into rotational mechanical energy; and
 - v. an energy generation unit, wherein the rotational mechanical energy is used to generate electrical energy.

Claim 2:

2. The gravitational mechanical energy generator of claim 1, further comprising of:
 - i. an internal cable system, including a left-hand rod with a sprocket and a right-hand rod with a sprocket, supporting a cable running centrally between the left-hand and right-hand sides of the track, to which the gravity enablers are attached;
 - ii. an increased rotational conversion system, including a series of interconnected sprockets and cables to amplify the rotational speed, connected to the magnetic generator;
 - iii. a motor connected to the rotational support system; means for applying part rotational movement to the track in either a clockwise or anti-clockwise direction at timed intervals;
 - iv. wherein the timed rotational movement of the rounded rectangular track ensures the continuous motion of the gravity enablers along the downward slopes and around the rounded corners, providing uninterrupted mechanical energy generation.

FIGURE 1 (a)

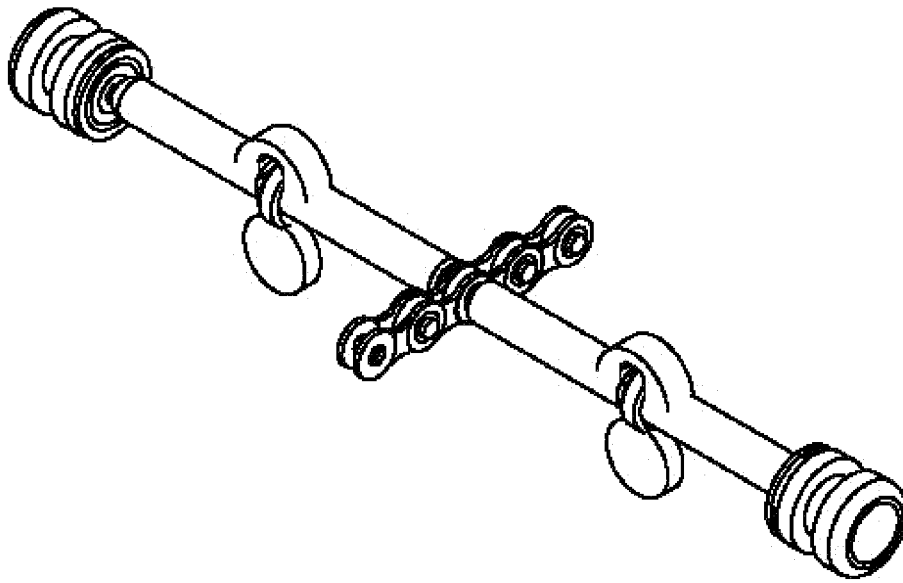


FIGURE 1 (b)

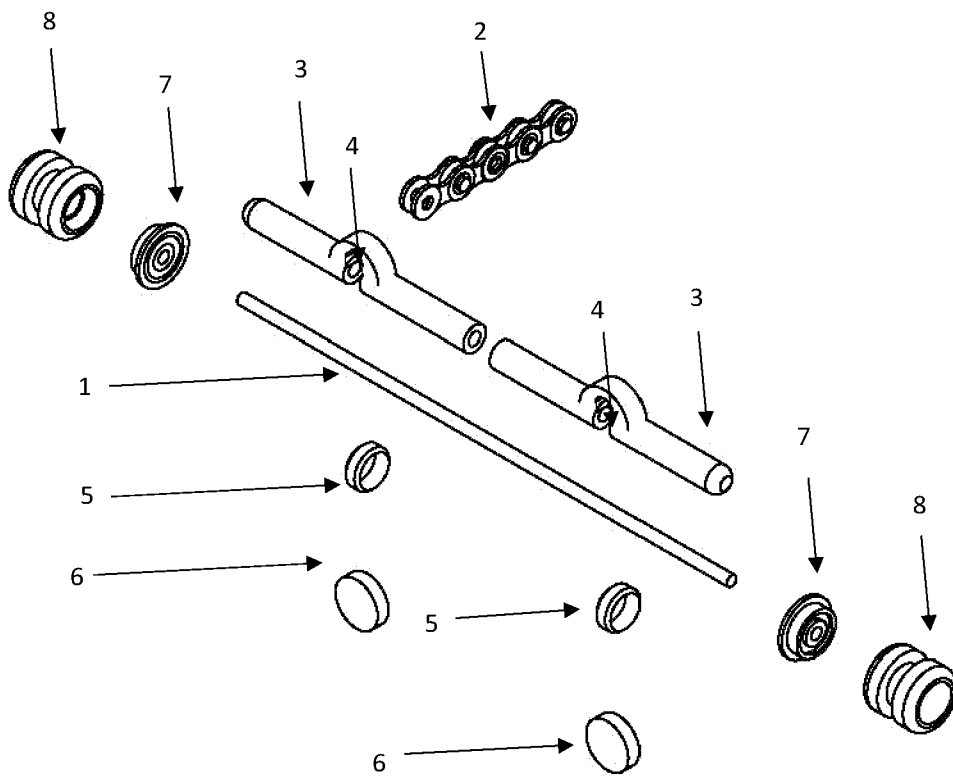


FIGURE 2 (a)

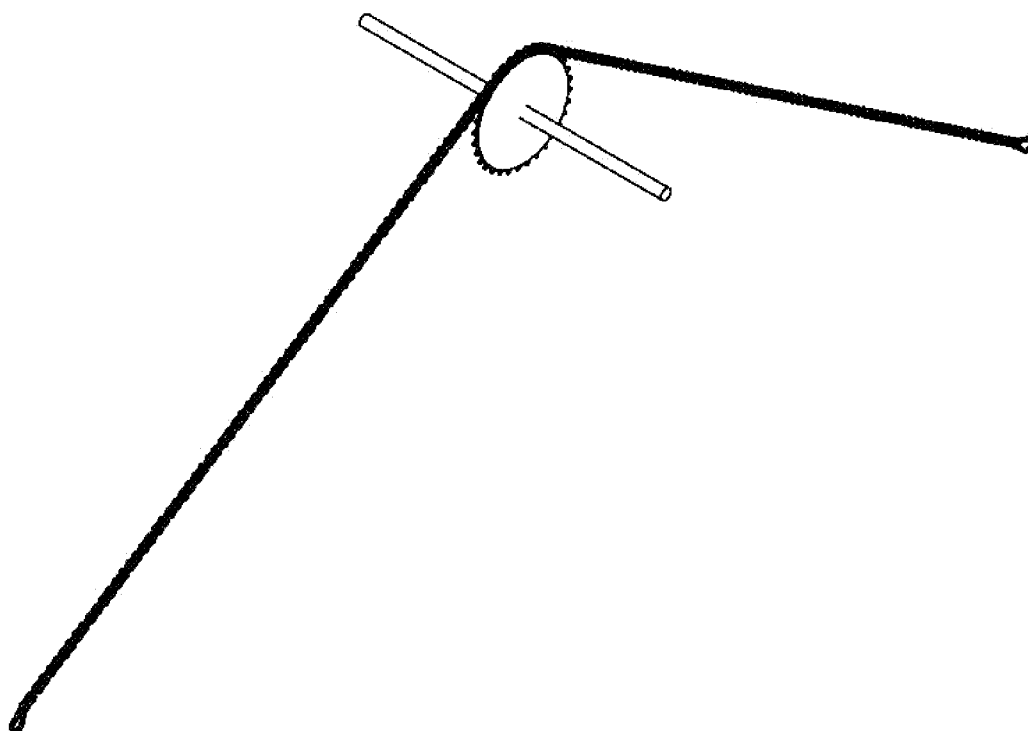


FIGURE 2 (b)

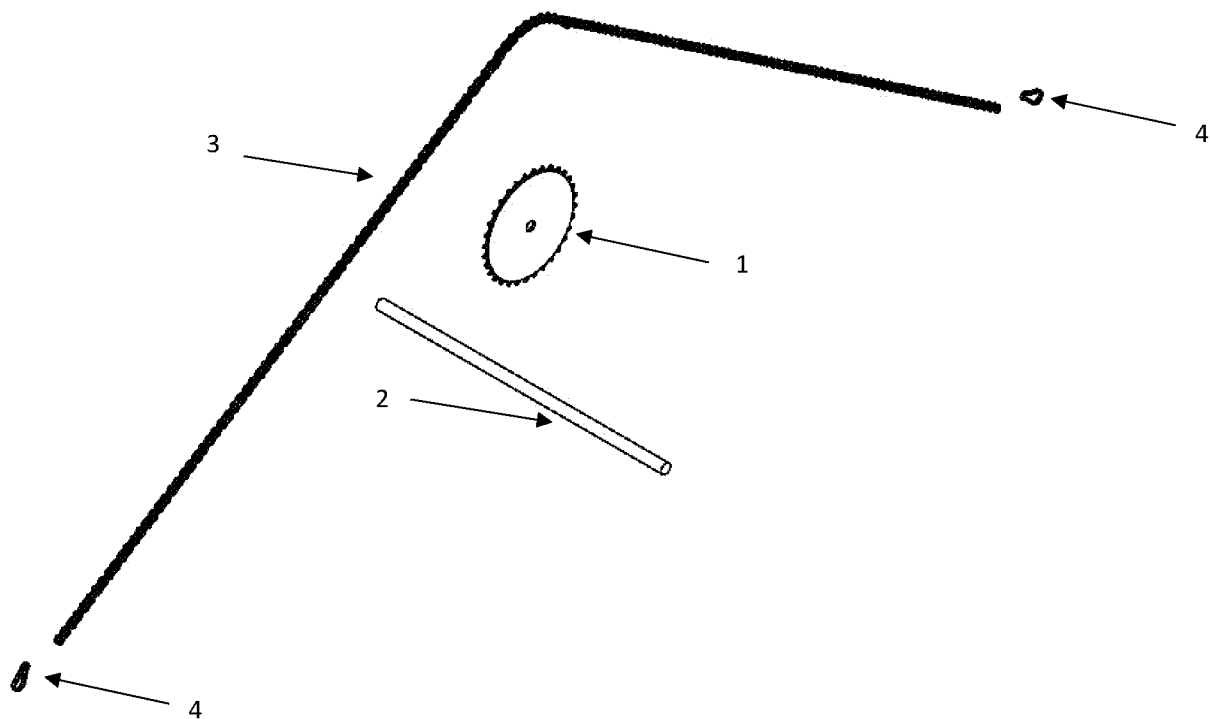


FIGURE 3 (a)

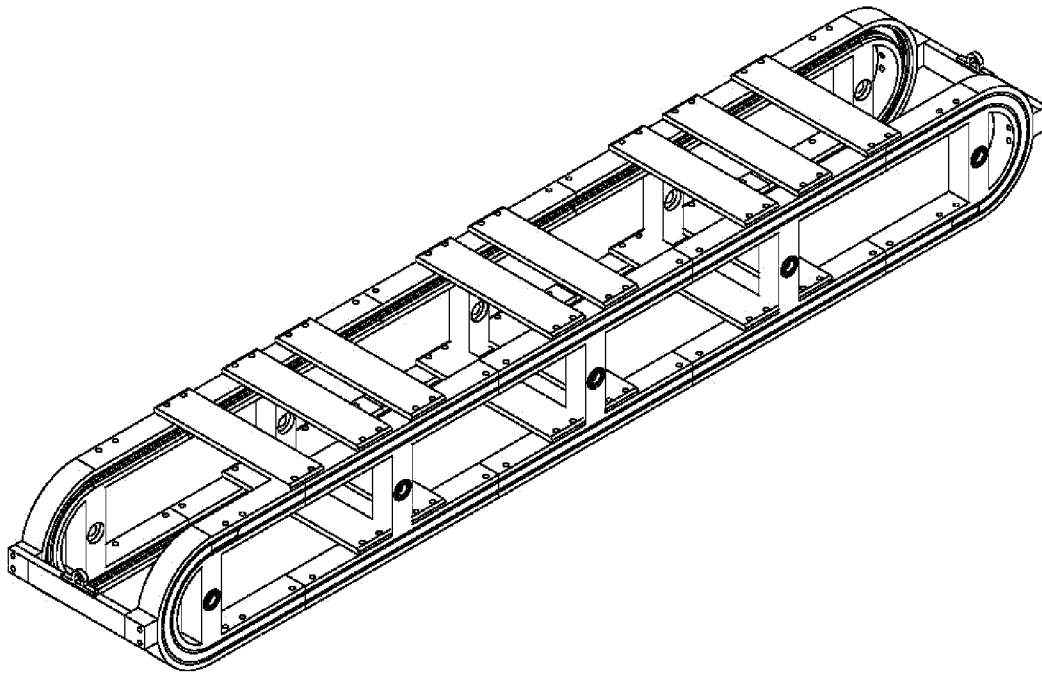


FIGURE 3 (b)

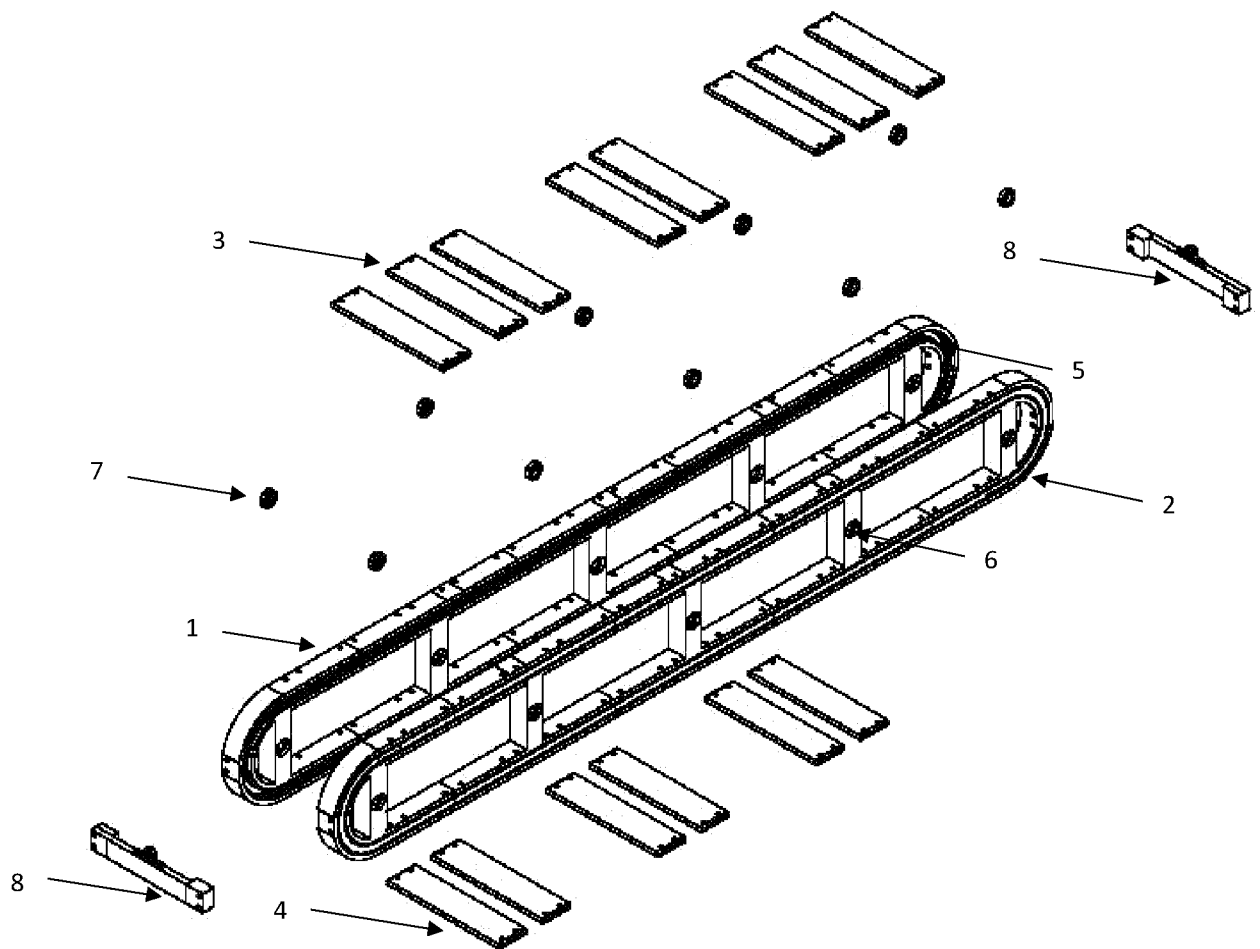


FIGURE 4 (a)

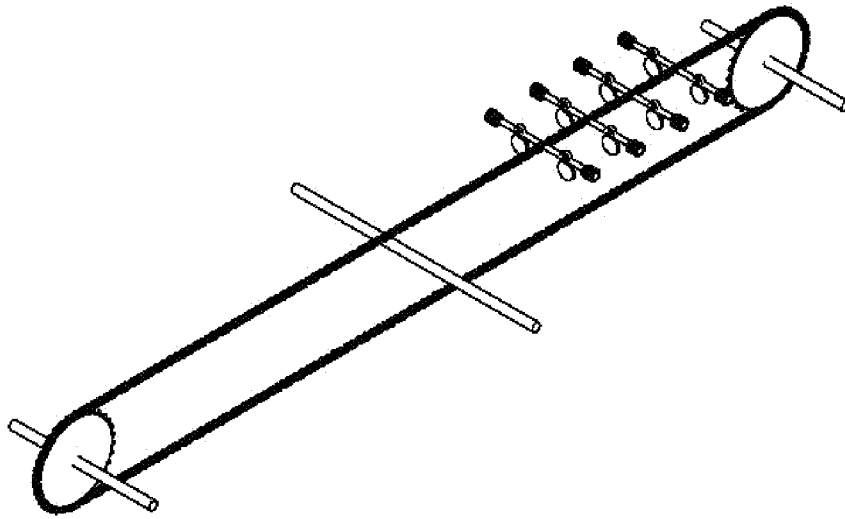


FIGURE 4 (b)

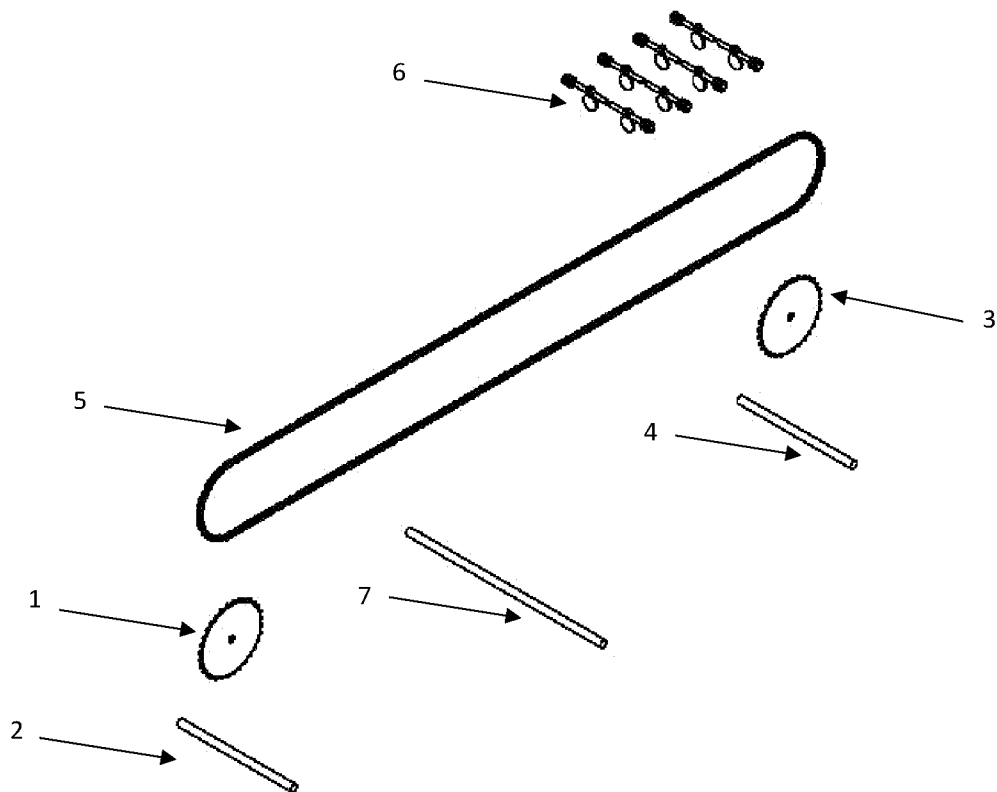


FIGURE 5 (a)

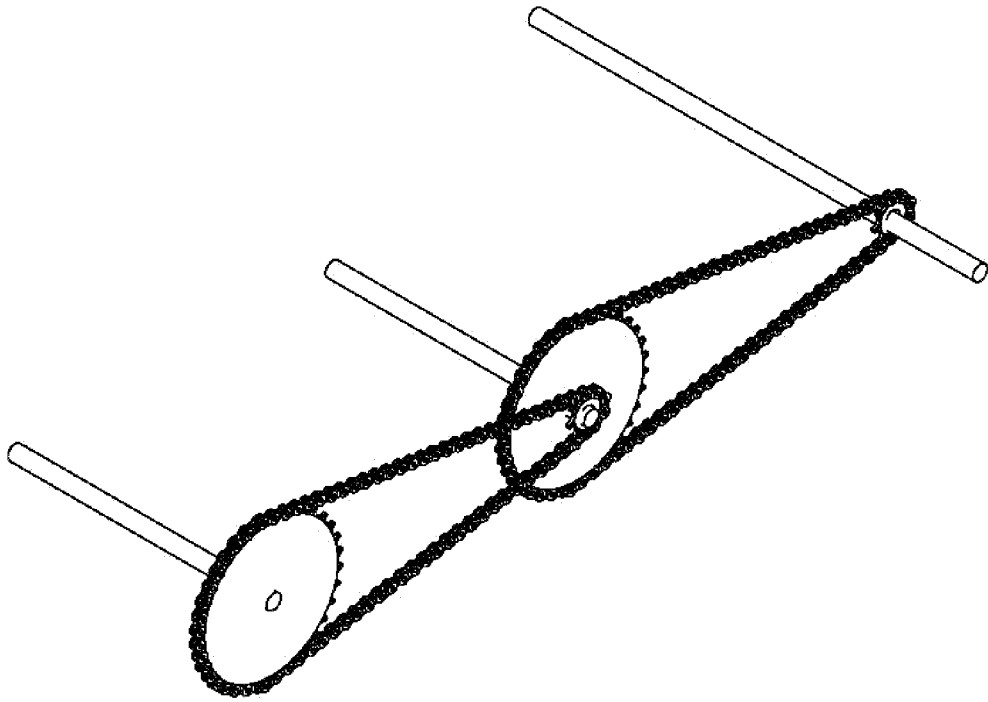


FIGURE 5 (b)

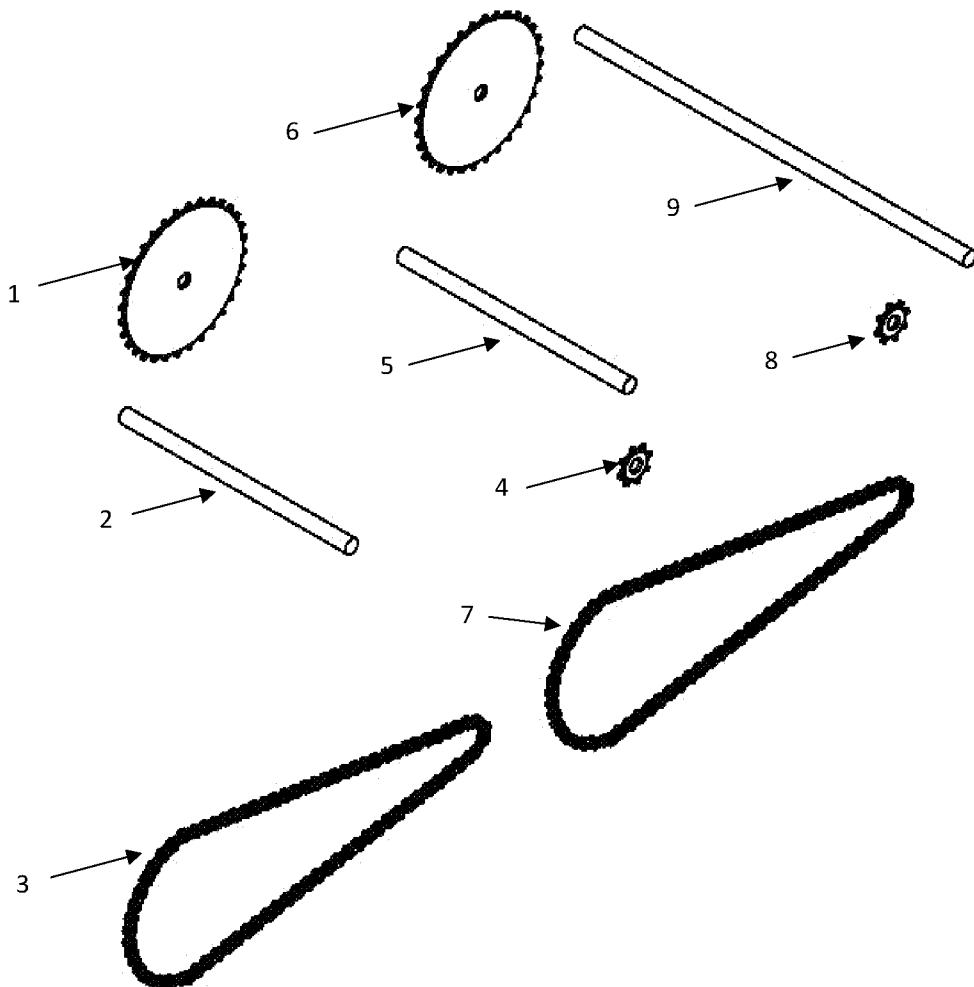


FIGURE 6

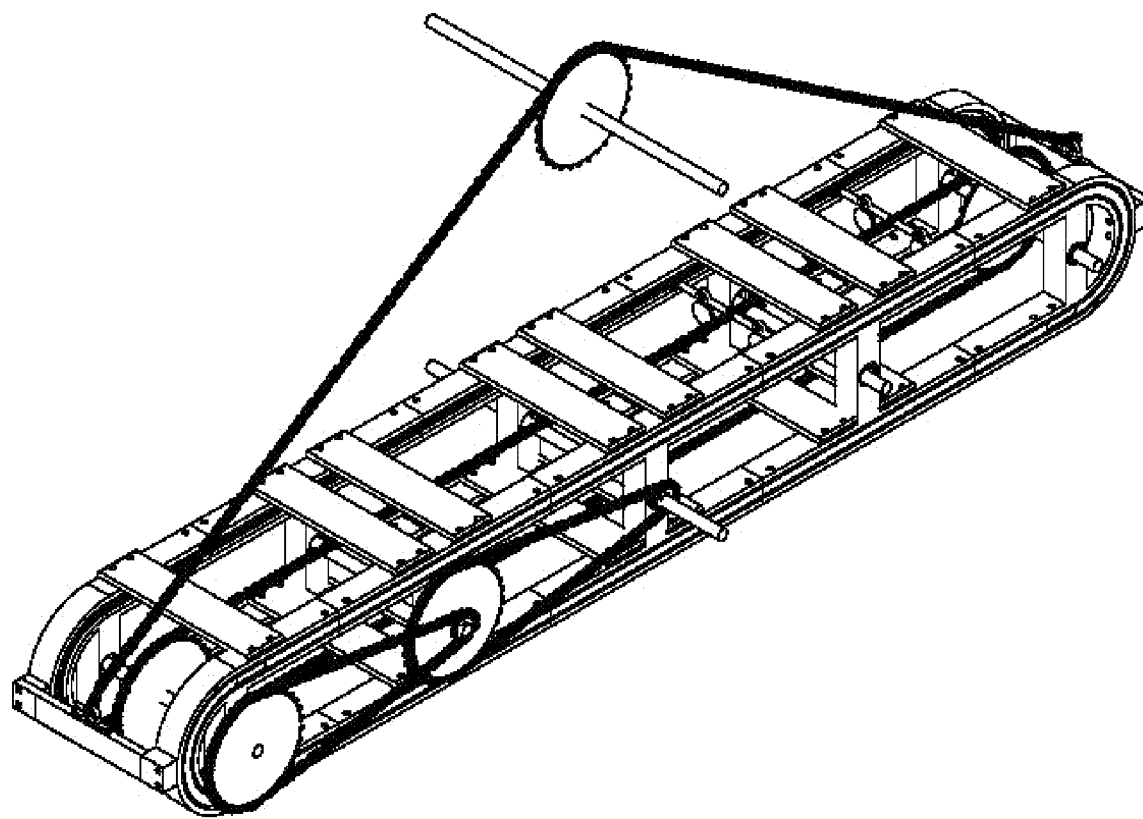
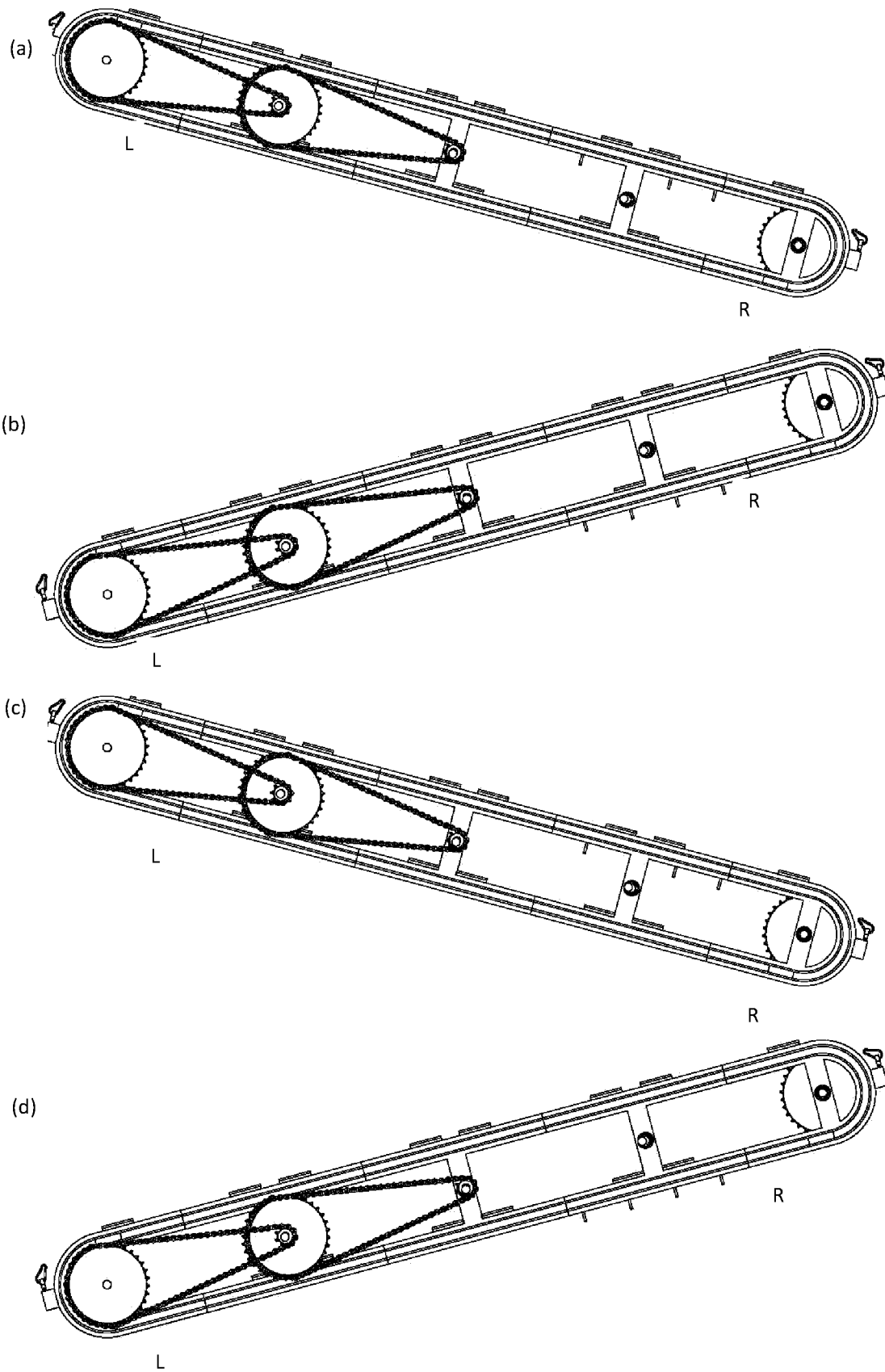


FIGURE 7



INTERNATIONAL SEARCH REPORT

International application No
PCT/GB2023/052482

A. CLASSIFICATION OF SUBJECT MATTER INV. H02J7/32 F03G3/00 H02K53/00 ADD.		
According to International Patent Classification (IPC) or to both national classification and IPC		
B. FIELDS SEARCHED Minimum documentation searched (classification system followed by classification symbols) H02J F03G H02K		
Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched		
Electronic data base consulted during the international search (name of data base and, where practicable, search terms used) EPO-Internal		
C. DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 2018/035713 A1 (HONG CHING SHING [CN]) 1 March 2018 (2018-03-01) paragraph [0021] - paragraphs [0070] - [0080]; figures 1-5D -----	1, 2
X	IT 2021 0002 6753 A1 (GIOVANNELLI PRIMO [IT]; ALBANESI FABIO [IT]) 4 April 2023 (2023-04-04) paragraphs [0029] - [0040]; figures 1-3 -----	1
X	CN 109 458 312 A (UNIV HEILONGJIANG TECHNOLOGY) 12 March 2019 (2019-03-12) paragraphs [0017] - [0034]; figures 1-4 -----	1
☐ Further documents are listed in the continuation of Box C. ☒ See patent family annex.		
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Date of the actual completion of the international search 11 April 2024		Date of mailing of the international search report 24/04/2024
Name and mailing address of the ISA/ European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Fax: (+31-70) 340-3016		Authorized officer Ossanna, Luca

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/GB2023/052482

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
WO 2018035713 A1	01-03-2018	NONE	

IT 202100026753 A1	04-04-2023	-----	
CN 109458312 A	12-03-2019	NONE	
