



(51) International Patent Classification:

B62D 55/06 (2006.01) *B62D 55/24* (2006.01)
B62D 55/10 (2006.01) *B62D 55/30* (2006.01)
B62D 55/14 (2006.01)

(21) International Application Number:

PCT/EP2016/057808

(22) International Filing Date:

8 April 2016 (08.04.2016)

(25) Filing Language:

English

(26) Publication Language:

English

(71) Applicant: **AHWI MASCHINENBAU GMBH** [DE/DE];
Im Branden 15, 88634 Herdwangen (DE).

(72) Inventors: **STEBEN, Eric**; 723 Dunlavey, Bromont,
Québec J2L 0J5 (CA). **MARLEAU, Benoît**; 1280 Sainte-
Catherine, St-Hyacinthe, Québec J2S 5Z4 (CA).

(74) Agent: **DAUB, Thomas**; Bahnhofstraße 5, 88662 Überlin-
gen (DE).

AO, AT, AU, AZ, BA, BB, BG, BH, BN, BR, BW, BY, BZ, CA, CH, CL, CN, CO, CR, CU, CZ, DE, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IR, IS, JP, KE, KG, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PA, PE, PG, PH, PL, PT, QA, RO, RS, RU, RW, SA, SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, TH, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

(84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH, GM, KE, LR, LS, MW, MZ, NA, RW, SD, SL, ST, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, RU, TJ, TM), European (AL, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, MC, MK, MT, NL, NO, PL, PT, RO, RS, SE, SI, SK, SM, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, KM, ML, MR, NE, SN, TD, TG).

Published:

— with international search report (Art. 21(3))

(81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM,

(54) Title: TRACKED MULCHING VEHICLE

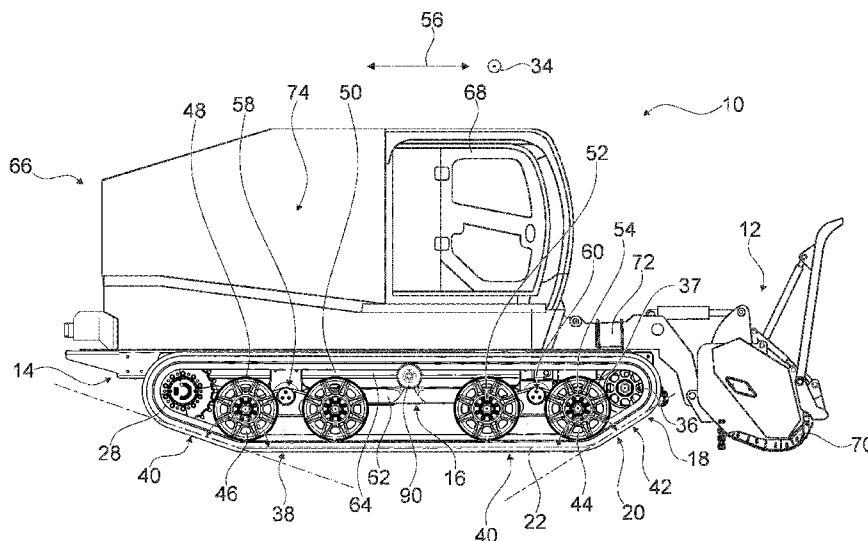


Fig. 1

(57) Abstract: For the purpose of improving a versatility, a tracked mulching vehicle (10) is proposed, which comprises a mulching tool (12) and an undercarriage (14) having a chassis (16) and at least one continuous track unit (18) arranged on the chassis (16), wherein the continuous track unit (18) comprises at least one continuous track (20) having at least one ground-engaging track element (22), which is made at least partly of an elastomer.



Tracked mulching vehicle

Background

The invention relates to a tracked mulching vehicle according to the preamble of claim 1.

- 5 Tracked mulching vehicles provided for off-road duties are known, hence continuous tracks of these tracked mulching vehicles are typically provided for moving in off-road terrain, e.g. rock, gravel, sand and/or soil, and are made of metal in order to withstand rough terrain. As a result, such tracked mulching vehicles are not suited for paved roads and will cause damage to the roads and/or to the continuous tracks.
- 10 The objective of the invention is in particular to provide a tracked mulching vehicle with improved characteristics regarding versatility and in particular to enable the tracked mulching vehicle to perform safely on different terrains, in particular off-road as well as on-road, without causing damage to either the roads and/or the continuous tracks.

- The objective is achieved, according to the invention, by the features of claim 1, while
- 15 advantageous implementations and further developments of the invention may be gathered from the dependent claims.

Advantages of the invention

- A tracked mulching vehicle is proposed, which comprises a mulching tool and an
- 20 undercarriage having a chassis and at least one continuous track unit mounted to the chassis, the continuous track unit comprising at least one continuous track having at least one ground-engaging track element made at least partly of an elastomer. A versatility of the tracked mulching vehicle can be improved. Moreover, damage to paved roads and/or to continuous tracks can be avoided. As a result of this, reliability and operative safety can

be improved while downtime can be reduced. In particular the continuous track can be designed lightweight in order to reduce an overall weight of the tracked mulching vehicle.

A "tracked mulching vehicle" is in particular to be understood, in this context, as a tracked vehicle which is specifically provided for processing, in particular for tilling, preferably
5 comminuting, ground and/or vegetation and preferably for grinding and/or harvesting biomass, and which is advantageously provided for safe use on different kinds of terrain, in particular on-road, e.g. on paved roads, as well as off-road, e.g. on rock, gravel, sand and/or soil. "Provided" is, in particular, to mean, specifically programmed, designed and/or equipped. By an object being provided for a certain function is to be understood, in
10 particular, that the object implements and/or fulfills said certain function in at least one application state and/or operating state. A "mulching tool" is, in particular, to be understood, in this context, as a driven unit which is provided for ground processing, in particular tilling, preferably comminuting and/or processing ground and/or vegetation and advantageously for milling, grinding, scarifying and/or clearing. In particular the mulching
15 tool comprises a rotary member, on which tool elements, in particular cutting elements or chains, are arranged. An "undercarriage" is, in particular, to be understood, in this context, as a load bearing unit at the bottom of the tracked mulching vehicle for supporting superstructures of the vehicle, such as a cabin, a drive unit, a housing, a storage container and/or the mulching tool. The chassis comprises in particular at least one frame and preferably at least two frames provided for mounting of the superstructures. The two
20 frames are in particular connected and are preferably arranged offset to each other preferably in a direction at least substantially perpendicular to a lengthwise and/or widthwise direction of the tracked mulching vehicle. The term "at least substantially perpendicular" is, in particular, intended to define, in this context, an orientation of a direction with respect to a reference direction, wherein the direction and the reference
25 direction, in particular if viewed in one plane, enclose an angle of between 80° and 100° , in particular of between 85° and 95° , preferably of between 88° and 92° and particularly advantageously of 90° . A "lengthwise direction" of an object is, in particular, to be understood, in this context, as a direction extending parallel to a longest side of an
30 imaginary cuboid, preferably an imaginary rectangular cuboid, which encloses the object only just entirely and advantageously extends through a geometric center of the object. A "widthwise direction" of an object is, in particular, to be understood, in this context, in particular as a direction perpendicular to the lengthwise direction. The undercarriage

comprises in particular the continuous track unit, in particular at least two, preferably precisely two, continuous track units, which are provided to move the tracked mulching vehicle with respect to the ground. The continuous track units are in particular arranged and preferably mounted on two different sides of the chassis. Moreover, in particular
5 viewed in the lengthwise direction of the vehicle, the continuous track units are preferably arranged on opposite sides of the chassis. The continuous track comprises in particular the ground-engaging track element and a ground-averted track element, which preferably form two opposite sides of the continuous track. In particular the ground-engaging track element and the ground-averted track element are connected to each other and are in
10 particular at least partly, preferably at least mostly and especially preferably entirely integrally implemented. By a first object and a second object being "at least partly integrally implemented" is, in particular, to be understood, in this context, that at least one part of a first object and at least one part of a second object are integrally implemented. "Integrally implemented" is, in particular, to be understood, in this context, as connected at
15 least by substance-to-substance bond, e.g. by a welding process, an adhesive bonding, an injection-molding process and/or by another process that is deemed expedient by a person having ordinary skill in the art. Advantageously, integrally could in particular be understood to mean made of one piece. "Made of one piece" is, in particular, to be understood, in this context, in particular as formed from one single piece, e.g. by
20 production from one single cast and/or by manufacturing in a one-component or multi-component injection-molding process and advantageously from a single blank. Furthermore, in particular, the ground-engaging track element may comprise at least one and preferable a plurality of grip elements provided for increasing traction to the ground. In particular at least the grip element can be made of the elastomer, thus preferably the
25 ground-engaging track element is at least partly made of the elastomer. Advantageously, the continuous track, in particular the ground-engaging track element and/or the ground-averted track element, are at least partly, preferably at least mostly and especially preferably entirely made of an elastomer, in particular of the same elastomer. The term „at least mostly“ is, in particular, to be understood as more than 50 %, advantageously more than 70 %, and particularly advantageously more than 90 %, in particular in relation to a
30 mass and/or a volume of an object. An "elastomer" is to be understood, in particular, as a viscoelastic and/or preferably a hyperelastic material and especially preferably a vulcanisate such as rubber.

Further, it is proposed that the continuous track comprises at least one reinforcement element provided for reinforcing the track element. The reinforcement element is in particular provided to reinforce the ground-engaging track element and/or preferably the ground-averted track element preferably in a direction at least substantially perpendicular to the lengthwise direction. By preference the reinforcement element is at least partly arranged on top of and/or above the ground-engaging track element and/or the ground-averted track element of the continuous track. Advantageously, the reinforcement element is at least partly, in particular at least mostly and preferably entirely arranged between the ground-engaging track element and the ground-averted track element. Further advantageously, the reinforcement element is at least partly, in particular at least mostly and preferably entirely embedded in the ground-engaging track element and/or the ground-averted track element. In a cross-section the reinforcement element comprises in particular an elongate, preferably a tapered profile. Furthermore, the continuous track may comprise in particular at least one additional reinforcement element. The additional reinforcement element is in particular provided to reinforce the ground-engaging track element and/or preferably the ground-averted track element in a direction at least substantially parallel to the lengthwise direction. By "at least substantially parallel" is, in particular, intended to be understood an orientation of a direction with respect to a reference direction, in particular in one plane, wherein the direction has a deviation from the reference direction in particular of less than 15° , advantageously of less than 10° and particularly advantageously of less than 2° . The additional reinforcement element is in particular at least substantially fiber-shaped. As a result, a stability of the continuous track can be improved. At least forces interacting with the continuous track perpendicularly to the lengthwise direction can be reduced. Moreover, a thickness of the continuous track can be reduced for the purpose of enhancing an overall flexibility and/or of facilitating an advantageously lightweight embodiment of the continuous track.

In order to improve a connection between the reinforcement element and the continuous track and to reduce production costs of the continuous track, it is proposed that the reinforcement element and the ground-engaging track element are integrally implemented. Furthermore, the reinforcement element, the additional reinforcement element, the ground-engaging track element and/or the ground-averted track element are in particular integrally implemented.

It is also proposed that a width of the reinforcement element and a width of the continuous track are at least substantially equal. The term "at least substantially equal" is to be understood, in this context, in particular as at least 65 %, at least 80 % and at least 95 %. Hence forces interacting with the continuous track perpendicularly to the lengthwise
5 direction can be reduced evenly across the width of the continuous track.

Moreover, it is proposed, that a material forming the reinforcement element is at least substantially more rigid than the elastomer. The material forming the reinforcement element is by in particular at least 10 times, preferably at least 50 times, advantageously at least 100 times and further advantageously at least 500 times more rigid than the
10 elastomer; in particular in regard to the elastic modulus of the elastomer. The material implementing the reinforcement element could in particular be another elastomer, which is preferably different from the before-mentioned elastomer. For example, in particular if rubber is the elastomer, which has an elastic modulus of 0.01 GPa to 0.1 GPa, then the material implementing the reinforcement element could be another elastomer, for example
15 polypropylene, which has an elastic modulus of 1.5 GPa to 2 GPa. In this way the stability, flexibility of the continuous track can be further improved and a lightweight construction of the continuous track is facilitated.

It is further proposed that the reinforcement element is at least partly, in particular mostly and preferably entirely made of metal and/or in particular of a metal alloy. The
20 reinforcement element can in particular comprise a metal, preferably of a metal alloy coating. In particular the metal is aluminum, copper, iron and/or titanium and in particular an alloy thereof. Advantageously the metal is steel. On account of this, the stability of the continuous track can be increased even further.

For the purpose of providing a reliable transmission between the drive unit and the
25 continuous track, it is proposed that the continuous track comprises at least one guiding element connected to the ground-engaging track element, the guiding element being provided for guiding at least one wheel of the continuous track unit. The guiding element is in particular shaped correspondingly to at least one wheel, preferably a drive wheel of the continuous track unit that in particular has a sprocket, for the purpose of engaging with
30 the wheel. In a cross-section the guiding element is in particular at least partly u-shaped and comprises two preferably tapered guiding walls provided for limiting a movement of the wheel in particular perpendicularly to the direction of the main extension of the tracked

mulching vehicle. In particular the guiding element and the reinforcement element, the ground-engaging track element and/or the ground-averted track element can be at least partly, preferably at least mostly and especially preferably entirely integrally implemented. The guiding element could in particular be made of a material that differs from the material
5 of the reinforcement element. Advantageously the respective materials which the reinforcement element and the guiding element are made of are identical. In one implementation of to the invention, it is proposed that the reinforcement element and the guiding element are made of one piece.

For the purpose of simplifying an assembly of the continuous track, it is also proposed that
10 the continuous track comprises at least one connecting element and at least one further ground-engaging track element, which is arranged parallel and offset to the ground-engaging track element in the widthwise direction and which is connected to the track element via the connecting element. The further ground-engaging track element is preferably at least substantially equal to the ground-engaging track element. The term “at
15 least substantially identical” is to be understood, in this context, in particular as identical preferably except for manufacturing variances and tolerances. Furthermore the connecting element can be integrally implemented with the ground-engaging track elements. In particular the connecting element, the guiding element, the reinforcement element, the ground-engaging track element and/or the ground-averted track element can
20 be at least partly, preferably at least mostly and especially preferably entirely integrally implemented. The connecting element could in particular be made of a material that differs from the material of the reinforcement element and/or of the guiding element. Advantageously the materials which the connecting element, the reinforcement element and/or the guiding element are made of are identical. In a preferred implementation of the
25 invention, it is proposed that the connection element and the reinforcement element are made of one piece.

In particular it is proposed that the continuous track unit comprises at least one track tensioner, which is arranged on a front side of the chassis and is provided for compensating blows to the continuous track. Furthermore, the track tensioner is in
30 particular provided for maintaining a tension of the continuous track. The track tensioner comprises in particular at least one idler wheel, which is provided to apply pressure to the continuous track in order to maintain a tension of the continuous track. The track tensioner

is in particular a fluidic damping device, e.g. a hydraulic or pneumatic damping device. As a result, it is possible to drive safely through rough terrain even though the continuous track is partly made of an elastomer.

It is also proposed that at least one first run of the continuous track and at least one
5 second run of the endless track form an obtuse angle of maximally 150° . A "run" is to be understood, in this context, in particular as a segment of the continuous track which extends from one wheel to one other wheel of the continuous track unit and which is preferably free of contact to any other wheels of the continuous track unit. In particular the first run and the second run abut each other directly. In particular the angle is an
10 approaching angle and/or a departure angle. An "approaching angle" is to be understood, in this context, in particular as an angle between a first run and a second run wherein, viewed in a forward direction of the tracked mulching vehicle, the first run is a run at a front region of the tracked mulching vehicle and the second run is a run in a middle region of the tracked mulching vehicle. In particular the approaching angle is maximally 150° and
15 at least 135° and is preferably variable depending on an amount of pressure which the track tensioner applies to the continuous track. A "departing angle" is to be understood, in this context, in particular as an angle between a first run and a second run wherein, viewed in a forward direction of the tracked mulching vehicle, the first run is a run at a rear region of the tracked mulching vehicle and the second run is a run in a middle region of
20 the tracked mulching vehicle. In particular the departing angle is maximally 150° and at least 135° . Furthermore, a departure angle is at least 135° . As a result, it is possible to safely drive over obstacles such as tree stumps, even though the continuous track is at least partly made out of an elastomer.

In addition, it is proposed that the continuous track unit comprises a plurality of support
25 wheels which are provided for supporting the continuous track and at least one other wheel, wherein at least one of the support wheels and the at least one other wheel at least partly overlap each other in the lengthwise direction. In particular the support wheel comprises a preferably at least substantially v-shaped recess which is provided for receiving the one other wheel. The support wheel in particular engages with the one other
30 wheel when viewed in the lengthwise direction at least partly from two opposite sides. The support wheels run in particular freely on the ground-averted track element. Furthermore, the support wheels are positioned with respect to the continuous track in such a way that

the recess receives the guiding element at least partly. The one other wheel is in particular the before-mentioned idler wheel. As a result, the continuous track unit can be implemented in an advantageously compact fashion.

Further, it is proposed that the chassis comprises at least one bogie to which at least two
5 support wheels of the continuous track unit are mounted and which is provided to compensate a deformation of the continuous track. The bogie is in particular provided to pivot the two support wheels with respect to the frame of the chassis. In particular, when viewed in a direction of a pivot axis of the bogie, the support wheels are mounted on different sides of the bogie. As a result, deformations of the run of the continuous track
10 can be compensated.

It is also proposed that the tracked mulching vehicle has a weight, in particular including the weight of the mulching tool, of at least 1.0 t, preferably of at least 1.1 t and especially preferably of at least 1.2 t. Moreover, the tracked mulching vehicle has a weight in particular of maximally 1.6 t, preferably of maximally, 1.5 t and especially preferably of
15 maximally 1.4 t. Advantageously, the tracked mulching vehicle has a weight of 1.38 t. The weight of the mulching tool is in particular at least 10 %, preferably at least 12 % and especially preferably at least 16 % of the weight of the tracked mulching vehicle. Furthermore, the weight of the mulching tool is in particular maximally 22 %, preferably maximally 20 % and especially preferably maximally 18 % of the weight of the tracked
20 mulching vehicle. As a result, a ground pressure can be reduced.

In a preferred implementation of the invention, it is proposed that a width of the continuous tracks, in particular of one single continuous track, is at least 15 %, in particular at least 20 % and preferably at least 25 % of a width of the undercarriage. By preference the width of the continuous track is maximally 40 %, in particular maximally 35% and preferably
25 maximally 30 %. Furthermore the length of the tracked mulching vehicle with the mulching tool is in particular at least 5500 mm, preferably 6000 mm and especially preferably 6500 mm and/or in particular maximally 8000 mm, preferably maximally 7500 mm and especially preferably maximally 7000 mm. A length of a portion of the continuous track which is in contact with the ground is in particular at least 40 %, preferably at least 45 %, and especially preferably at least 50 % and/or in particular maximally 65 %, preferably
30 maximally 60 % and especially preferably maximally 55 % of the length of the vehicle. As a result, a ground pressure can be further reduced.

In a particularly preferred implementation of to the invention, it is proposed that the tracked mulching vehicle has a ground pressure of maximally 0.34 kg/cm^2 , in particular of maximally 0.30 kg/cm^2 and preferably of maximally 0.26 kg/cm^2 . Furthermore, tracked mulching vehicle has in particular a ground pressure of at least 0.16 kg/cm^2 , preferably of at least 0.20 kg/cm^2 and especially preferably of at least 0.24 kg/cm^2 . Advantageously, the tracked mulching vehicle has a ground pressure of 0.25 kg/cm^2 . As a result, a mobility of the tracked mulching vehicle can be improved.

The tracked mulching vehicle is herein not to be limited to the application and implementation described above. In particular, for the purpose of fulfilling a functionality herein described, the tracked mulching vehicle can comprise a number of respective elements, structural components and units that differs from the number mentioned herein. Furthermore, regarding the value ranges mentioned in this disclosure, values within the limits mentioned are to be understood to be also disclosed and to be used as applicable.

15 Drawing

Further advantages may be gathered from the following description of the drawing. In the drawing one exemplary embodiment of the invention is shown. The drawing, the description and the claims contain a plurality of features in combination. The person having ordinary skill in the art will purposefully also consider the features separately and will find further expedient combinations.

It is shown in:

- Fig. 1 a tracked mulching vehicle in a side view,
- Fig. 2 an undercarriage of the tracked mulching vehicle in a perspective view,
- Fig. 3 a cross-section view of a continuous track of the tracked mulching vehicle, and
- Fig. 4 a top view of a portion of the continuous track.

Description of the drawing of the exemplary embodiment

Figure 1 shows a tracked mulching vehicle 10. The tracked mulching vehicle 10 is in this case provided for biomass harvesting. Additionally or alternatively the tracked mulching vehicle 10 could be provided for processing, in particular for tilling, preferably
5 comminuting, ground and/or vegetation and preferably for grinding. Furthermore, the tracked mulching vehicle 10 is advantageously provided for safe use on different kinds of terrain, in particular on-road, e.g. on paved roads, as well as off-road, e.g. on rock, gravel, sand and/or soil.

The tracked mulching vehicle 10 has a weight of at least 1.0 t. In this case the tracked
10 mulching vehicle 10 has a weight of 1.38 t. Alternatively, the weight of the tracked mulching vehicle 10 may vary in particular between at least 1.0 t, preferably at least 1.1 t and especially preferably at least 1.2 t, and/or in particular maximally 1.6 t, preferably maximally 1.5 t and especially preferably maximally 1.4 t.

Figure 2 shows an undercarriage 14 of the tracked mulching vehicle 10 in a perspective
15 view. The tracked mulching vehicle 10 comprises the undercarriage 14. The undercarriage 14 is a load bearing unit. The undercarriage 14 is arranged at a bottom of the tracked mulching vehicle 10. The undercarriage 14 is provided for support of superstructures 66 of the tracked mulching vehicle 10. The undercarriage 14 has a width in a widthwise direction 34 of the tracked mulching vehicle 10 of 2450 mm. Alternatively,
20 the width of the undercarriage 14 may vary between at least 2000 mm and at a maximum 3000 mm.

The undercarriage 14 has a chassis 16. The chassis 16 is provided for mounting of the superstructures 66. The chassis 16 comprises at least one frame 62, 64. The frame 62, 64 is at least provided for mounting of superstructures. The frame 62, 64 has a width in the
25 widthwise direction 34 which corresponds at least substantially to a standard truck size. As a result different superstructures 66, in particular standard truck equipment like cabins, containers, housings and drive units, can be mounted to the chassis 16 easily. Furthermore these superstructures 66 can be arranged according to requirements. In this case the chassis 16 comprises two such frames 62, 64, in particular a first frame 62 and a
30 second frame 64. Furthermore, the two frames 62, 64 are arranged offset to each other. The two frames 62, 64 are offset to each other in a direction at least substantially

perpendicular to a lengthwise direction 56 and/or the widthwise direction 34 of the tracked mulching vehicle 10. The two frames 62, 64 are connected to each other.

The tracked mulching vehicle 10 comprises the superstructures 66 (see figure 1). The superstructures 66 are arranged on top of the undercarriage 14. The superstructures 66 are mounted to the chassis 16. The superstructures 66 are mounted to at least one of the frames 62, 64 of the chassis 16, in particular to the second frame 64. The tracked mulching vehicle 10 comprises a cabin 68. The cabin 68 is one of the superstructures 66. The cabin 68 is arranged on a front portion of the undercarriage 14.

Further, the tracked mulching vehicle 10 comprises a mulching tool 12. The mulching tool 12 is arranged at a front region of the undercarriage 14. The mulching tool 12 is one of the superstructures 66. The mulching tool 12 is provided for ground processing. Alternatively or additionally the mulching tool 12 may be provided for tilling, preferably comminuting and/or processing ground and/or vegetation and advantageously for milling, grinding, scarifying and/or clearing. The mulching tool 12 comprises a rotary member 70. The rotary member 70 comprises tool elements, in particular cutting elements or chains. The length of the tracked mulching vehicle 10 with the mulching tool 12 is in this case 6696 mm. Alternatively the length of the tracked mulching vehicle 10 with the mulching tool 12 may vary between in particular at least 5500 mm, preferably 6000 mm and especially preferably 6500 mm, and/or in particular maximally 8000 mm, preferably maximally 7500 mm and especially preferably maximally 7000 mm. The mulching tool 12 comprises a pivot arm 72. The pivot arm 72 is provided for height adjustment of the rotary member 70 with respect to the undercarriage 14. The rotary member 70 can be positioned between at least 285 mm beneath and maximally 1043 mm above than a base of the undercarriage 14.

Furthermore, the mulching tool 12 is driven by a drive unit 74. The tracked mulching vehicle 10 comprises a driveline (not shown). The drive line connects the drive unit 74 with the mulching tool 12. The driveline comprises an anti-stall protection unit (not shown). The anti-stall protection unit is provided to electronically control a rotation speed of the rotary member 70. The anti-stall protection unit is directly connected to a clutch (not shown) of the drive unit 74. If the rotary member 70 loses speed, the clutch can be disengaged and thus prevent stalling of the drive unit 74.

The weight of the mulching tool 12 is 19 % of the weight of the tracked mulching vehicle 10. In the present case the weight of the mulching tool is 2.2 t. Alternatively the weight of the mulching tool 12 may vary between in particular at least 10 %, preferably at least 12 % and especially preferably at least 16 %, and/or in particular maximally 22 %, preferably maximally 20 % and especially preferably maximally 18 % of the weight of the tracked mulching vehicle 10.

The tracked mulching vehicle 10 comprises the drive unit 74. The drive unit 74 is one of the superstructures 66. The drive unit 74 is arranged on a rear side of the undercarriage 14. The drive unit 74 is arranged entirely to the rear of the cabin 68. The drive unit 74 is at least provided to power the mulching tool 12. Furthermore, the drive unit 74 is provided to power at least a continuous track unit 18 of the tracked mulching vehicle 10.

The undercarriage 14 has at least one continuous track unit 18. In this particular embodiment the undercarriage has two continuous track units 18. The continuous track units 18 are at least substantially identical. For greater clarity only one of the two continuous track units 18 is given a reference numeral in the figures. The continuous track units 18 are provided to move the tracked mulching vehicle 10 with respect to the ground. The continuous track units 18 are in particular arranged and preferably mounted on two different sides of the chassis 16. Moreover, in particular viewed in the lengthwise direction 56 of the tracked mulching vehicle 10, the continuous track units 18 are arranged on opposite sides of the chassis 16. The two continuous track units 18 are arranged mirror-symmetrically to each other. In the following, only one continuous track unit 18 will be described in detail, while all of the following description may also be applied to the other continuous track unit. The continuous track unit 18 is mounted to the chassis 16, in particular to the first frame 62 of the chassis.

The continuous track unit 18 comprises at least one continuous track 20. In the present case the continuous track unit 18 comprises precisely one continuous track 20. Alternatively or additionally the continuous track 20 unit 18 may comprise more than one continuous track. A width of the continuous track 20 is at least 15 % of a width of the undercarriage 14. By preference the width of the continuous track 20 may vary between in particular at least 15 %, preferably at least 20 % and especially preferably at least 25 %, and/or in particular maximally 40 %, preferably maximally 35% and especially preferably maximally 30 % of the width of the undercarriage 14. In the present case the width of the

continuous track 20 is 29% of the width of the undercarriage 14. The width of the continuous track 20 is 700 mm. A length of a portion of the continuous track 20 which is in contact with the ground is in the present case 52 % of the length of the tracked mulching vehicle 10. Alternatively this length may vary between in particular at least 40 %, preferably at least 45 %, and especially preferably at least 50 %, and in particular maximally 65 %, preferably maximally 60 % and especially preferably maximally 55 % of the length of the tracked mulching vehicle 10. A ground pressure of the tracked mulching vehicle 10 depends on the weight of the tracked mulching vehicle 10, the width of the continuous tracks 20 of the continuous track unit 18 and the portion of the continuous track 20 which is in contact with the ground. In the present case, the tracked mulching vehicle 10 has a ground pressure of 0.25 kg/cm². Alternatively the ground pressure may vary between in particular maximally 0.34 kg/cm², preferably maximally 0.30 kg/cm² and especially preferably maximally 0.26 kg/cm², and/or in particular at least 0.16 kg/cm², preferably at least 0.20 kg/cm² and especially preferably at least 0.24 kg/cm².

Figure 3 shows a cross-section view of the continuous track 20. The continuous track 20 has at least one ground-engaging track element 22. Furthermore the continuous track 20 comprises a ground-averted track element 76. The continuous track 20 comprises at least one further ground-engaging track element 32. The further ground-engaging track element 32 is at least substantially identical to the ground-engaging track element 22. The continuous track 20 comprises at least one further ground-averted track element 88. The further ground-averted track element 88 is at least substantially identical to the ground-averted track element 76. The further ground-engaging track element 32 and/or to the further ground-averted track element 88 are arranged parallel and offset to the ground-engaging track element 22 and/or to the ground-averted track element 76 in the widthwise direction 34 of the tracked mulching vehicle 10. In the following, the ground-engaging track element 22 and the ground-averted track element 76 will be described in detail, while all of the following description may also be applied to the further ground-engaging track element 32 and/or to the further ground-averted track element 88.

The ground-engaging element 22 is at least partly made of an elastomer. In the present case the ground-engaging element 22 is entirely made of an elastomer. Furthermore, in the present case the elastomer is rubber. Furthermore, the ground-engaging track element 22 comprises a grip element 78. The grip element 78 is provided for increasing

traction to the ground. The ground-engaging track element 22 and the ground-averted track element 76 are connected to each other. The ground-engaging track element 22 and the ground-averted track element 76 form two opposite sides of the continuous track 20. The ground-engaging track element 22 and the ground-averted track element 76 are
5 integrally implemented in. In the present case the ground-averted track element 76 is also entirely made of an elastomer, in particular the aforementioned elastomer.

The continuous track 20 comprises at least one reinforcement element 24 provided for reinforcing the ground-engaging track element 22 and/or preferably the ground-averted track element 76. The reinforcement element 24 is provided to reinforce the ground-
10 engaging track element 22 and/or preferably the ground-averted track element 76 in a direction at least substantially perpendicular to the lengthwise direction 56. A width of the reinforcement element 24 and a width of the continuous track 20 are at least substantially equal. In a cross-section view the reinforcement element 24 comprises, in the widthwise direction 34 of the tracked mulching vehicle 10, an elongate, preferably tapered profile.

15 The reinforcement element 24 is at least partly arranged between the ground-engaging track element 22 and the ground-averted track element 76. The reinforcement element 24 is at least partly embedded in the ground-engaging track element 22 and/or in the ground-averted track element 76. The reinforcement element 24 and the ground-engaging track element 22 are integrally implemented.

20 Furthermore the continuous track 20 comprises at least one additional reinforcement element 80. In the present case the continuous track 20 comprises a plurality of additional reinforcement elements 80, which are at least substantially identical. The additional reinforcement element 80 is provided to reinforce the ground-engaging track element 22 and/or preferably the ground-averted track element 76 in a direction at least substantially
25 parallel to the lengthwise direction 56. The additional reinforcement element 80 is in particular at least substantially fiber-shaped.

The reinforcement element 24, the additional reinforcement element 80, the ground-engaging track element 22 and/or the ground-averted track element 76 are in particular integrally implemented.

30 A material implementing the reinforcement element 24 and/or in particular the additional reinforcement element 80 is at least substantially more rigid than the elastomer, in

particular the aforementioned elastomer. In the present case the reinforcement element 24 and/or in particular the additional reinforcement element 80 are/is made of metal, in particular steel. The material implementing the reinforcement element 24 is at least 100 times more rigid than the elastomer, in particular in regard to the elastic modulus. Alternatively or additionally the reinforcement element 24 and/or the additional reinforcement element 80 can be made of a different elastomer which is more rigid than the elastomer which the ground-engaging track element 22 is made of.

The continuous track 20 comprises at least one guiding element 26. The guiding element 26 is connected to the ground-engaging track element 22. The guiding element 26 is provided for guiding at least one wheel 28 of the continuous track unit 18. The guiding element 26 is in particular shaped correspondingly at least to the one wheel 28. In the present case the one wheel 28 is a drive wheel of the continuous track unit 18. The one wheel 28 has a sprocket 82 for the purpose of engaging with the guiding element 26. In a cross-section view the guiding element 26 is at least partly u-shaped. The guiding element 26 comprises two, preferably tapering guiding walls 84, 86. The guiding walls 84, 86 are provided to limit a movement of the one wheel 28 in the widthwise direction 34 of the tracked mulching vehicle 10.

The guiding element 26 and the reinforcement element 24 are at least partly integrally implemented. In the present case the guiding element 26 and the reinforcement element 24 are entirely integrally implemented. Furthermore, the guiding element 26, the ground-engaging track 22 element and/or the ground-averted track element 76 are at least partly integrally implemented. Moreover, the guiding element 26, the ground-engaging track 22 element and/or the ground-averted track element 76 are at least partly integrally implemented. The guiding element 26 could in particular be made of a material that differs from the material which the reinforcement element 24 is made of. In the present case the respective materials which the reinforcement element 24 and the guiding element 26 are made of are identical. The reinforcement element 24 and the guiding element 26 are made of one piece.

Figure 4 shows a top view of the continuous track 20. The continuous track 20 comprises at least one connecting element 30. The connecting element 30 connects the further ground-engaging track element 32 with the ground-engaging track element 22. In the present case the reinforcement element 24 and the connecting element 30 are at least

partly integrally implemented. Furthermore the connecting element 30 can be integrally implemented with the ground-engaging track elements 22, 32. The connecting element 30, the guiding element 26, the reinforcement element 24, the ground-engaging track elements 22, 32 and/or the ground-averted track elements 76, 88 can be at least partly
5 integrally implemented. The connecting element 30 could in particular be made of a material that differs from the material/materials of the reinforcement element 24 and/or of the guiding element 26. Advantageously the materials which the connecting element 30, the reinforcement element 24 and/or the guiding element 26 are made of are identical. In the present case the connection element 30 and the reinforcement element 24 are made
10 of one piece.

The continuous track unit 18 comprises a plurality of wheels (see figure 1). The wheels are at least provided to keep the continuous track 20 in place. The continuous track unit 18 comprises at least one upper wheel 90. The upper wheel 90 is mounted to the chassis 16. The upper wheel 90 is provided to avoid slacking of the continuous track 20 due to
15 gravitational force. The upper wheel 90 abuts the continuous track 20. The upper wheel 90 applies pressure to the continuous track 20 in a direction counter to a gravitational force acting on the continuous track 20.

The continuous track unit 18 comprises a plurality of support wheels 48, 50, 52, 54. In this particular embodiment the continuous track unit 18 comprises four support wheels 48, 50,
20 52, 54. The support wheels 48, 50, 52, 54 are provided for supporting the continuous track 20. The support wheels 48, 50, 52, 54 are provided to press the continuous track 20 onto the ground. The support wheels 48, 50, 52, 54 run on a surface of the ground-averted track element 24.

The support wheels 48, 50, 52, 54 are mounted to the chassis 16. The chassis 16
25 comprises at least one bogie 58, 60. The bogies 58, 60 are spaced apart from one another in the lengthwise direction 56 of the tracked mulching vehicle 10. Respectively at least two of the support wheels 48, 50, 52, 54 of the continuous track unit 18 are mounted onto each of the bogies 58, 60. The bogies 58, 60 are provided to compensate a deformation of the continuous track 20. The bogies 58, 60 are provided to pivot the
30 support wheels 48, 50, 52, 54 with respect to the frame 62, 64 of the chassis 16. Viewed in a direction of a pivot axis of each bogie 58, 60, the support wheels 48, 50, 52, 54 are mounted on different sides of each bogie 58, 60.

The support wheels 48, 50, 52, 54 run freely on the ground-averted track element 76. At least one of the support wheels 48, 50, 52, 54 and one other wheel 36 overlap each other at least partly in the lengthwise direction 56. The support wheels 48, 50, 52, 54 each comprise a recess 92. The recess 92 is viewed in a cross section at least substantially v-shaped. The recess 92 is provided for receiving the at least one other wheel 36 at least partly. The support wheel 44 in particular engages with the one other wheel 36. In the present case the one other wheel 36 is embodied as an idler wheel. The support wheels 48, 50, 52, 54 are positioned with respect to the continuous track 20 in such a way that the recess 92 receives the guiding element 26 at least partly.

10 The continuous track unit 18 comprises a track tensioner 37. The track tensioner 37 is arranged on a front portion of a side of the chassis 16. The track tensioner 37 is provided for compensating blows to the continuous track 20. Furthermore, the track tensioner 37 is in particular provided for maintaining a tension of the continuous track 20. The track tensioner 37 comprises the one other wheel that is embodied as an idler wheel. The idler wheel applies pressure to the continuous track in order to maintain a tension of the continuous track 20. As a result the idler wheel reduces the size of the support wheels 48, 15 50, 52, 54 while maintaining the tension of the continuous track 20. The track tensioner 37 is embodied in particular as a fluidic damping device, e.g. a hydraulic or pneumatic damping device.

20 The continuous track 20 comprises a first run 38. The first run 38 extends between at last two support wheels 48, 50. The continuous track 20 further comprises a second run 40. The second run 40 extends from the support wheel 48 to the one wheel 28, which is in particular embodied as the drive wheel. The first run 38 and the second run 40 form an obtuse angle 46 of maximally 150°. The first run 38 and the second run 40 form a 25 departing angle.

Furthermore, the continuous 20 track comprises a further first run 41. The further first run 41 extends between at last two support wheels 52, 54.

The continuous track 20 comprises a further second run 42. The further second run 42 extends from the support wheel 54 to the one other wheel 36, which is in particular the 30 idler wheel. The further first run 41 and the further second run 42 form an obtuse angle 44 of maximally 150°. In particular the obtuse angle 44 may vary depending on how much

pressure the track tensioner 37 applies to the continuous track 20. The further first run 41 of the continuous track 20 and the further second run 42 of the continuous track 20 form an approaching angle.

Claims

1. A tracked mulching vehicle (10), which comprises a mulching tool (12) and an undercarriage (14) having a chassis (16) and at least one continuous track unit (18) arranged on the chassis (16), wherein the continuous track unit (18) comprises at least one continuous track (20) having at least one ground-engaging track element (22), which is made at least partly of an elastomer.
5
2. The tracked mulching vehicle (10) according to claim 1, wherein the continuous track (20) comprises at least one reinforcement element (24), which is provided for reinforcing the ground-engaging track element (22).
10
3. The tracked mulching vehicle (10) according to claim 2, wherein the reinforcement element (24) and the ground-engaging track element (22) are integrally implemented.
4. The tracked mulching vehicle (10) according to claim 2 or 3, wherein a width of the reinforcement element (24) and a width of the continuous track (20) are at least substantially equal.
15
5. The tracked mulching vehicle (10) according to one of claims 2 to 4, wherein a material implementing the reinforcement element (24) is more rigid than the elastomer.
- 20 6. The tracked mulching vehicle (10) according to one of claims 2 to 5, wherein the reinforcement element (24) is at least partly made of metal.

- 5 7. The tracked mulching vehicle (10) according to one of the preceding claims, wherein the continuous track (20) comprises at least one guiding element (26), which is connected to the ground-engaging track element (22), the guiding element (26) being provided for guiding at least one wheel (28) of the continuous track unit (18).
8. The tracked mulching vehicle (10) according to claims 2 and 7, wherein the reinforcement element (24) and the guiding element (26) are made of one piece.
- 10 9. The tracked mulching vehicle (10) according to one of the preceding claims, wherein the continuous track (20) comprises at least one connecting element (30) and at least one further ground-engaging track element (32), which is arranged parallel and offset to the ground-engaging track element (22) in a widthwise direction (34) of the tracked mulching vehicle (10) and which is connected to the ground-engaging track element (22) via the connecting element (30).
- 15 10. The tracked mulching vehicle (10) according to claims 2 and 9, wherein the connecting element (30) and the reinforcement element (24) are made of one piece.
- 20 11. The tracked mulching vehicle (10) according to one of the preceding claims, wherein the continuous track unit (18) comprises at least one track tensioner (37), which is arranged on a front portion of a side of the chassis (16) and is provided for compensating blows to the continuous track (20).
- 25 12. The tracked mulching vehicle (10) according to one of the preceding claims, wherein at least one first run (38, 41) of the continuous track (20) and at least one second run (40, 42) of the continuous track (20) form an obtuse angle (44, 46) of maximally 150°.

13. The tracked mulching vehicle (10) according to one of the preceding claims, wherein the continuous track unit (18) comprises a plurality of support wheels (48, 50, 52, 54) provided for supporting the continuous track (20), and comprises at least one other wheel (36), wherein at least one of the support wheels (48, 50, 52, 54) and the one other wheel (36) at least partly overlap each other in a lengthwise direction (56) of the tracked mulching vehicle (10).
14. The tracked mulching vehicle (10) according to one of the preceding claims, the chassis comprising at least one bogie (58, 60), on which at least two support wheels (48, 50, 52, 54) of the continuous track unit (18) are mounted and which is provided to compensate a deformation of the continuous track (20).
15. The tracked mulching vehicle (10) according to one of the preceding claims, which has a weight of at least 1.0 t.
16. The tracked mulching vehicle (10) according to one of the preceding claims, wherein a width of the continuous track (20) is at least 15 % of the width of the undercarriage (14).
17. The tracked mulching vehicle (10) according to one of the preceding claims, which has a ground pressure of maximally 0.40 kg/cm^2 .

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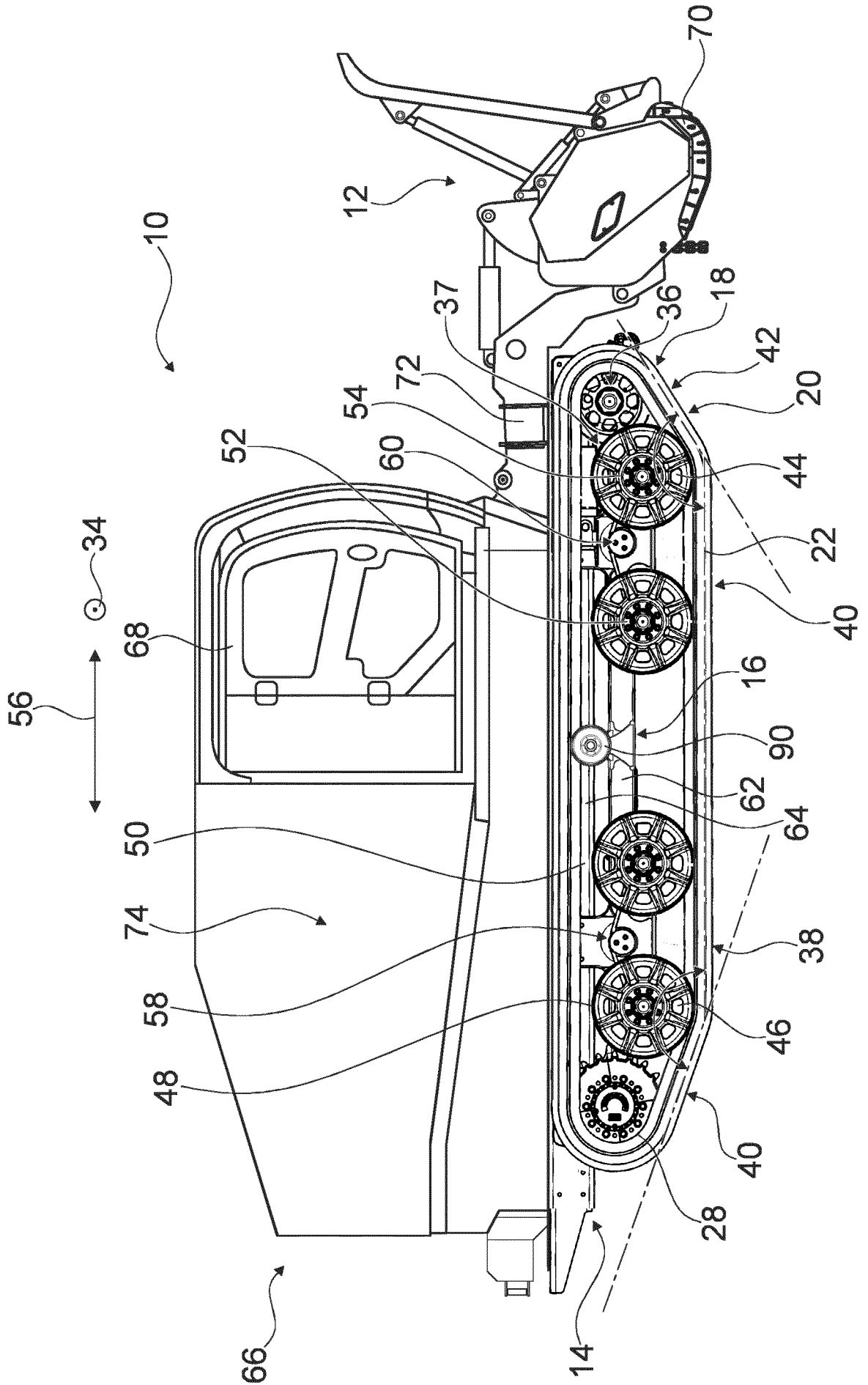


Fig. 1

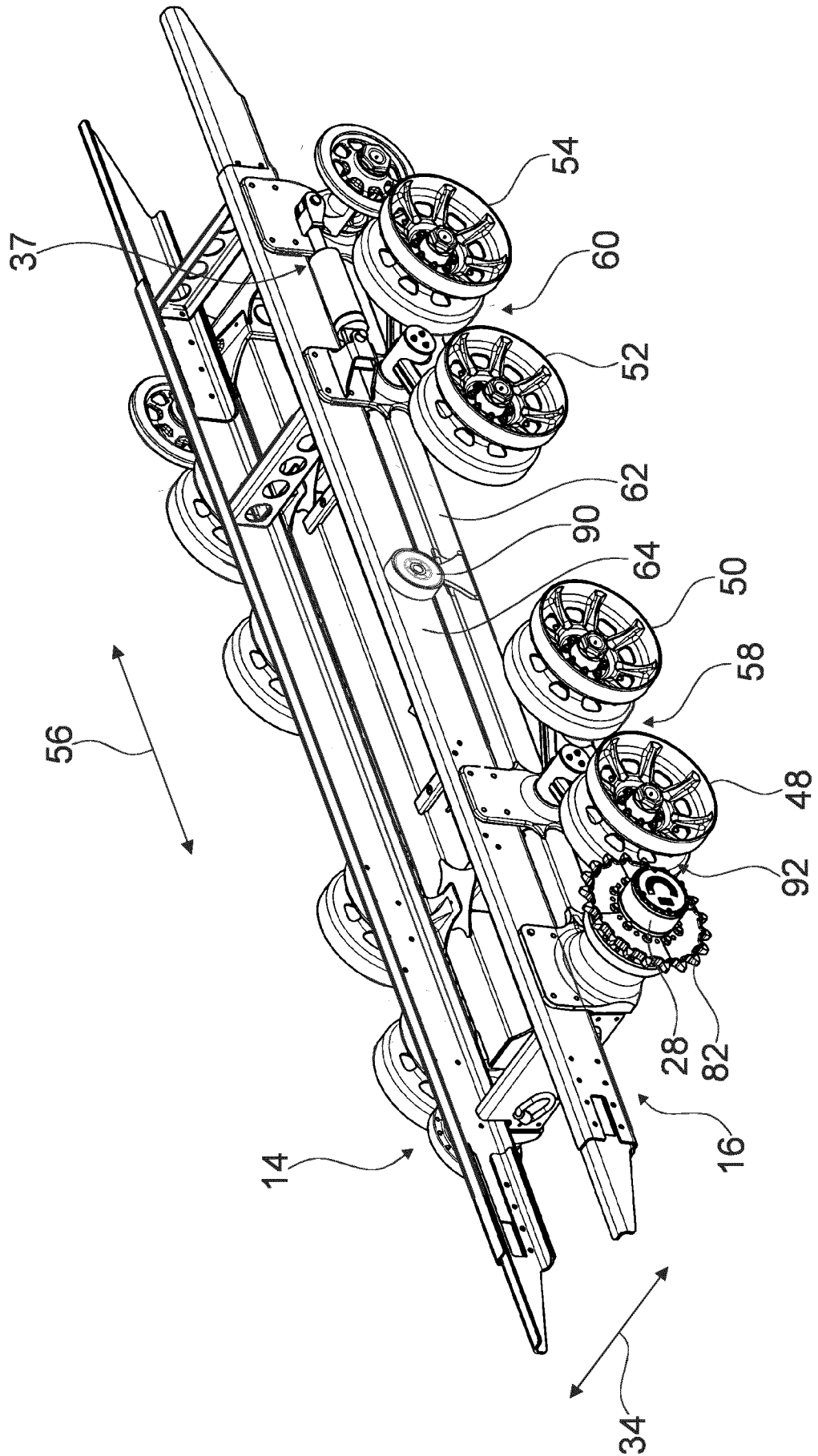


Fig. 2

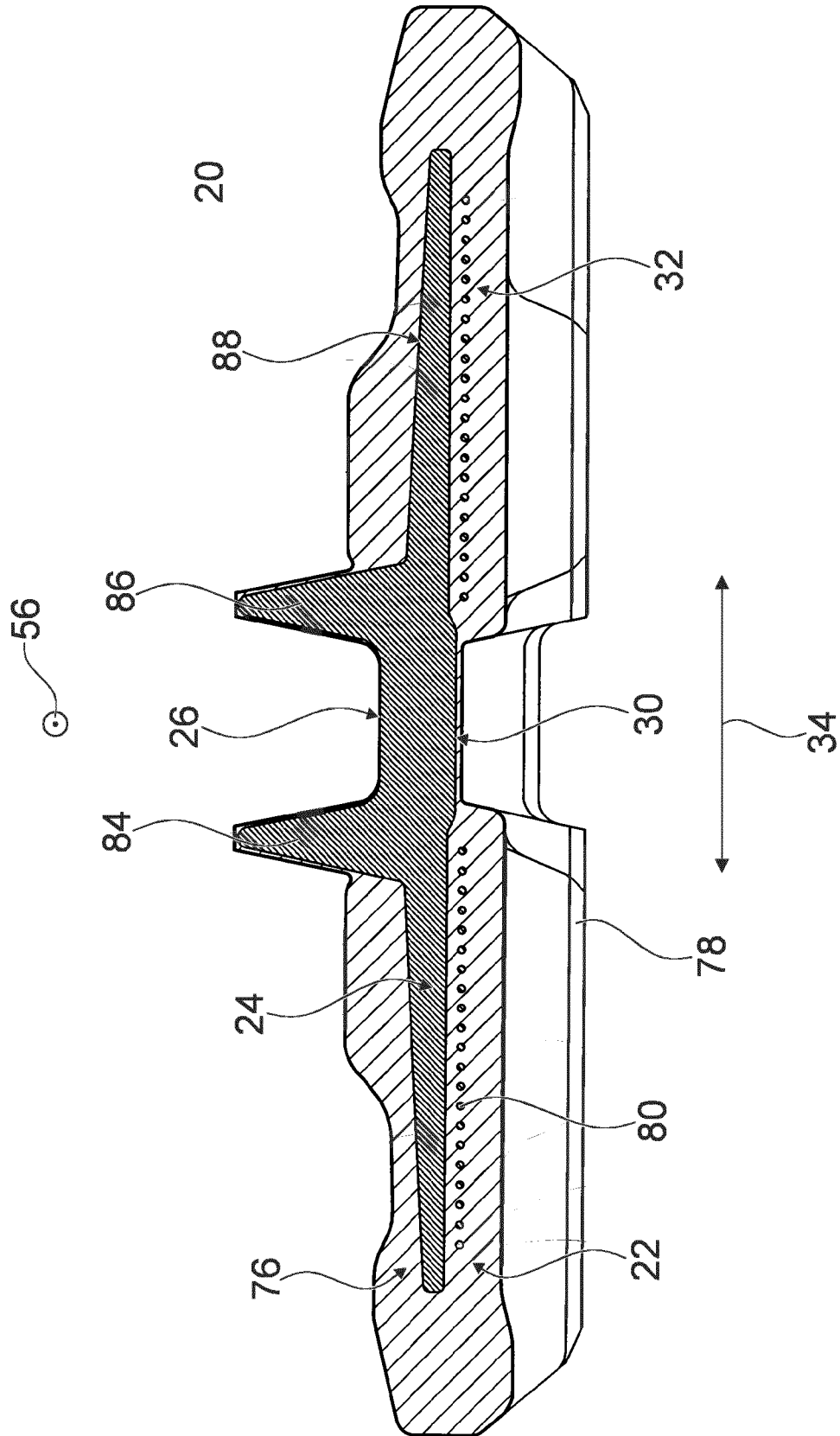


Fig. 3

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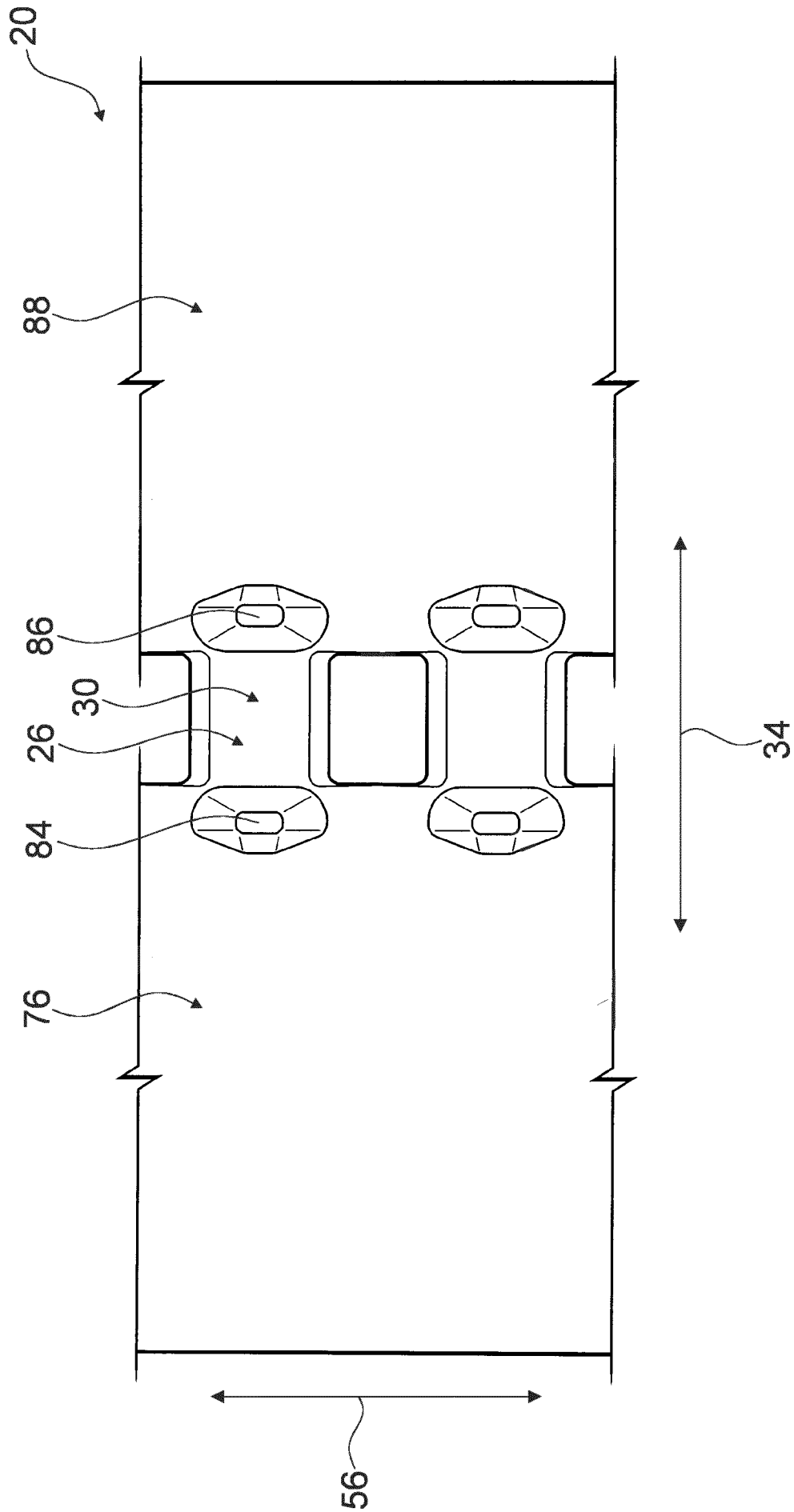


Fig. 4

INTERNATIONAL SEARCH REPORT

International application No
PCT/EP2016/057808

A. CLASSIFICATION OF SUBJECT MATTER
 INV. B62D55/06 B62D55/10 B62D55/14 B62D55/24 B62D55/30
 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)
 B62D

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, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X A	US 2010/295367 A1 (KIM GEUK BAE [KR] ET AL) 25 November 2010 (2010-11-25) the whole document	1-11, 15-17 12-14
X	WO 2013/029165 A1 (ROLIC INVEST SARL [LU]; STEBEN ERIC [CA]; MARLEAU BENOIT [CA]) 7 March 2013 (2013-03-07) page 22, line 13 - page 23, line 2; figure 15 page 24, line 29 - page 25, line 22 page 26, line 12 - page 28, line 7; figures 29,30 page 30, line 7 - line 24; figure 37 ----- -/--	1-17

Further documents are listed in the continuation of Box C.

See patent family annex.

* Special categories of cited documents :

<p>"A" document defining the general state of the art which is not considered to be of particular relevance</p> <p>"E" earlier application or patent 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 when the document is taken alone</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>
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Date of the actual completion of the international search 3 January 2017	Date of mailing of the international search report 12/01/2017
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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 Burley, James
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INTERNATIONAL SEARCH REPORT

International application No
PCT/EP2016/057808

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
E	WO 2016/198130 A1 (PRINOTH LTD [CA]) 15 December 2016 (2016-12-15) page 7, line 25 page 8, line 6 - line 9 page 28, line 14 - line 39; figures 27,28 page 30, line 29 - line 35; figures 41,42 figure 3 page 27, line 21 - line 41; figure 42 -----	1-11,13, 14

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No PCT/EP2016/057808

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 2010295367 A1	25-11-2010	CA 2704901 A1 US 2010295367 A1	22-11-2010 25-11-2010

WO 2013029165 A1	07-03-2013	CA 2846662 A1 EP 2750964 A1 EP 2799315 A2 JP 2014529544 A US 2014174839 A1 US 2015008052 A1 WO 2013029165 A1	07-03-2013 09-07-2014 05-11-2014 13-11-2014 26-06-2014 08-01-2015 07-03-2013

WO 2016198130 A1	15-12-2016	NONE	
