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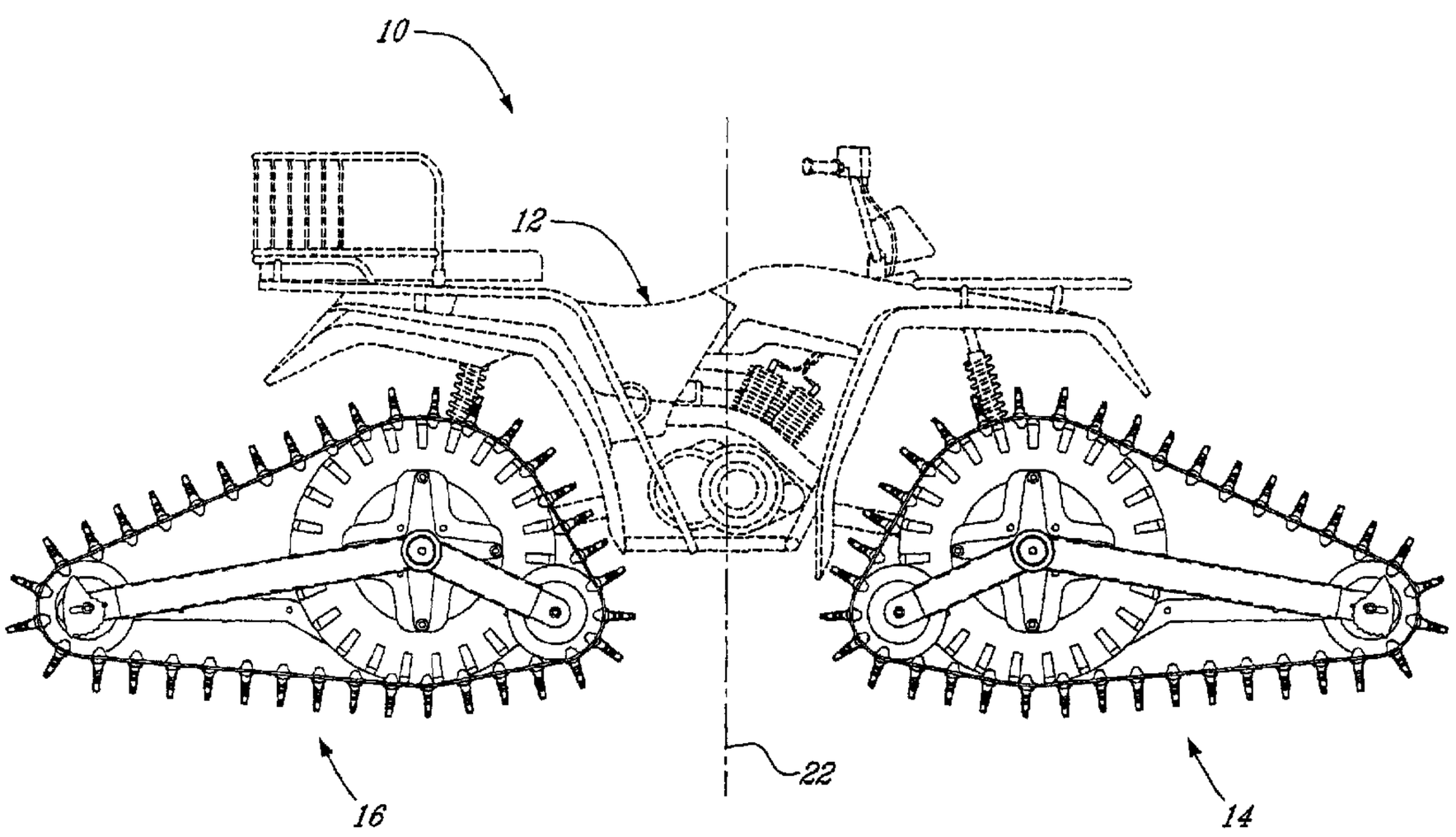
(54) **Titre : CHENILLES POUR VEHICULE TOUT TERRAIN**
(54) **Title: TRACK ASSEMBLY FOR AN ALL-TERRAIN VEHICLE**



(57) **Abrégé/Abstract:**
The present invention is concerned with track assemblies for an all-terrain vehicle, which make it maneuverable and effective upon a variety of unstable, uneven, stable and even surfaces, while designed to maintain tension upon the endless track belts to keep them in their due course and prevent accidental loosening while having a punctually localized surface contact with a ground surface, and at the same time reducing the damages inflicted on the terrain.

ABSTRACT OF THE DISCLOSURE

The present invention is concerned with track assemblies for an all-terrain vehicle, which make it maneuverable and effective upon a variety of unstable, uneven, stable and even surfaces, while designed to maintain tension upon the endless track belts to keep them in their due course and prevent accidental loosening while having a punctually localized surface contact with a ground surface, and at the same time reducing the damages inflicted on the terrain.

TITLE OF THE INVENTION

Track assembly for an all-terrain vehicle

FIELD OF THE INVENTION

[0001] The present invention relates to all-terrain vehicles. More specifically, the present invention is concerned with track assemblies for an all-terrain vehicle.

BACKGROUND OF THE INVENTION

[0002] Traditionally, two types of all-terrain vehicles are proposed either the wheel type or the tracked type.

[0003] Generally, a wheeled vehicle is more maneuverable than a tracked vehicle, but is not as efficient on uneven or soft terrain such as, for example snow.

[0004] Tracked all-terrain vehicles have been proposed, which require complicated track assemblies comprising a track frame to maintain the tension of the endless track belt and prevent it from loosening. Furthermore, such vehicles have generally a large contact area with the ground, which results in a decreased maneuverability and an increased impact on the often soft terrain.

[0005] Therefore, there is still room for improvements toward an all-terrain vehicle provided with track assemblies, which is maneuverable and effective upon a variety of unstable or uneven surfaces, while designed to maintain tension upon the endless track belts to keep them in their due course

and prevent accidental loosening, and at the same time reducing damages inflicted on the terrain.

OBJECTS OF THE INVENTION

[0006] An object of the present invention is therefore to provide improved track assemblies for an all-terrain vehicle.

SUMMARY OF THE INVENTION

[0006A] In accordance with an aspect of the present invention, there is provided a track assembly for a reduced-size vehicle designed primarily for off-highway usage, over undeveloped roads or other unprepared surfaces. The track assembly has a leading end and a trailing end. The track assembly comprises: an endless track having an outer ground engaging surface and an opposite inner surface; and a plurality of wheels for supporting and driving the endless track. The plurality of wheels includes: a leading idler, a trailing idler and a drive wheel. The leading and trailing idlers are in a spaced apart relationship. A segment of the endless track extending between the leading and trailing idlers defines a ground engaging run. The leading idler has a first axis of rotation and the trailing idler has a second axis of rotation. The drive wheel has a third axis of rotation. The drive wheel is in driving engagement with the endless track for imparting movement to the endless track. The drive wheel overlaps with one of the leading idler and the trailing idler when viewed in a plane normal to the third axis of rotation.

[0006B] In accordance with another aspect of the present invention, there is provided a track assembly for a reduced-size vehicle designed primarily for off-highway usage, over undeveloped roads or other unprepared surfaces. The track assembly comprises: an endless track having an outer ground engaging surface and an opposite inner surface; and a plurality of wheels for supporting and driving the

endless track. The plurality of wheels includes: an idler having a first axis of rotation; and a drive wheel having a second axis of rotation. The drive wheel is in driving engagement with the endless track for imparting movement to the endless track. The sum of a radius of the idler and a radius of the drive wheel exceeds a distance between the first axis of rotation and the second axis of rotation.

[0006C] In accordance with another aspect of the present invention, there is provided a track assembly for providing traction to an all-terrain vehicle (ATV). The track assembly is configured to replace a ground-engaging wheel of the ATV. The track assembly comprises a plurality of wheels and an endless track disposed around the plurality of wheels. The plurality of wheels includes: a drive wheel, and a leading idler wheel and a trailing idler wheel spaced apart from the leading idler wheel in a longitudinal direction of the track assembly. The drive wheel and a given one of the leading idler wheel and the trailing idler wheel overlap in the longitudinal direction of the track assembly. The endless track comprises: an inner surface for facing the plurality of wheels, the drive wheel being rotatable to impart motion to the endless track; a ground-engaging outer surface opposite to the inner surface; and a plurality of traction projections projecting from the ground-engaging outer surface.

[0006D] In accordance with another aspect of the present invention, there is provided a track assembly for providing traction to an all-terrain vehicle (ATV). The track assembly is configured to replace a ground-engaging wheel of the ATV. The track assembly comprises a plurality of wheels and an endless track disposed around the plurality of wheels. The plurality of wheels includes: a drive wheel; and a leading idler wheel and a trailing idler wheel spaced apart from the leading idler wheel in a longitudinal direction of the track assembly. A sum of a radius of the drive wheel and a radius of a given one of the leading idler wheel and the trailing idler wheel is greater than a distance in the longitudinal direction of the track assembly between an axis of rotation of the drive wheel and an axis of rotation of the given one of the leading idler wheel and the trailing idler wheel. The endless track

comprises: an inner surface for facing the plurality of wheels, the drive wheel being rotatable to impart motion of the endless track; a ground-engaging outer surface opposite to the inner surface; and a plurality of traction projections projecting from the ground-engaging outer surface.

[0006E] In accordance with another aspect of the present invention, there is provided a track assembly for a reduced-size vehicle designed primarily for off-highway usage, over undeveloped roads or other unprepared surfaces. The track assembly comprises a plurality of wheels and an endless track disposed around the plurality of wheels. The plurality of wheels includes: a drive wheel; and a leading idler wheel and a trailing idler wheel spaced apart from the leading idler wheel in a longitudinal direction of the track assembly. The bottom of the drive wheel is positioned below a top of a given one of the leading idler wheel and the trailing idler wheel. The endless track comprises: an inner surface for facing the plurality of wheels, the drive wheel being rotatable to impart motion of the endless track; a ground-engaging outer surface opposite to the inner surface; and a plurality of traction projections projecting from the ground-engaging outer surface.

[0006F] In accordance with yet another aspect of the invention, there is provided a track assembly for providing traction to a vehicle. The track assembly comprises a plurality of wheels which includes a drive wheel, a leading idler wheel, and a trailing idler wheel. An axis of rotation of the drive wheel is located between an axis of rotation of the leading idler wheel and an axis of rotation of the trailing idler wheel in a longitudinal direction of the track assembly. The drive wheel overlaps with a given one of the leading idler wheel and the trailing idler wheel when viewed in a direction parallel to the axis of rotation of the drive wheel. The track assembly comprises a track disposed around the wheels. The track comprises flexible material to flex around the wheels. The track comprises an inner surface for facing the wheels, a ground-engaging outer surface opposite to the inner surface, and a plurality of traction projections projecting from the ground-engaging outer surface

and distributed in a longitudinal direction of the track. A bottom run of the track extends under the leading idler wheel and the trailing idler wheel. The bottom run of the track comprises an intermediate section located between the leading idler wheel and the trailing idler wheel; a leading section rising from the intermediate section and extending towards the leading idler wheel; and a trailing section rising from the intermediate section and extending towards the trailing idler wheel.

[0006G] In accordance with a further aspect of the invention, there is provided a track assembly for providing traction to a vehicle. The track assembly comprises a plurality of wheels which includes a drive wheel, a leading idler wheel, and a trailing idler wheel. An axis of rotation of the drive wheel is located between an axis of rotation of the leading idler wheel and an axis of rotation of the trailing idler wheel in a longitudinal direction of the track assembly. A distance between the axis of rotation of the drive wheel and the axis of rotation of the leading idler wheel in the longitudinal direction of the track assembly is different from a distance between the axis of rotation of the drive wheel and the axis of rotation of the trailing idler wheel in the longitudinal direction of the track assembly. The drive wheel overlaps with a given one of the leading idler wheel and the trailing idler wheel when viewed in a direction parallel to the axis of rotation of the drive wheel. The track assembly comprises a track disposed around the wheels. The track comprises flexible material to flex around the wheels. The track comprises an inner surface for facing the wheels, a ground-engaging outer surface opposite to the inner surface, and a plurality of traction projections projecting from the ground-engaging outer surface and distributed in a longitudinal direction of the track. A bottom run of the track extends under the leading idler wheel and the trailing idler wheel.

[0007] In accordance with another aspect of the present invention, there is provided an all-terrain vehicle comprising at least two track assemblies to support the all-terrain vehicle onto a ground surface, each one of said at least two track assemblies comprising: a longitudinal endless track belt provided with an inner

surface provided with a plurality of inner lugs and an outer surface provided with a plurality of external lugs; a mounting structure to mount said longitudinal endless track belt to said vehicle, wherein, when mounted to said mounting structure, said longitudinal endless track belt has a punctually localized surface contact with the ground surface.

[0008] In accordance with another aspect of the present invention, there is provided an endless track belt assembly comprising: a track driving wheel provided

with a plurality of teeth; an endless track belt provided with an inner surface having a plurality of inner lugs and an outer surface having a plurality of external lugs, said endless track belt being wounded around said track driving wheel; wherein a) said teeth are so spaced that a distance between two consecutive teeth spans a distance separating two consecutive inner lugs of said endless track belt and b) said endless track belt, when mounted to said track driving wheel, has a punctually localized contact with a ground surface.

[0009] In accordance with another aspect of the present invention, there is provided a method for mounting an endless track belt on a all-terrain vehicle, comprising the acts of: providing an endless track belt having inner lugs and external lugs; providing a track driving wheel having a plurality of teeth so spaced that a distance between two consecutive of the plurality of teeth spans a distance separating two consecutive of a plurality of inner lugs of the endless track belt; interconnecting the track driving wheel to an inside idler wheel and to an outside idler wheel; and tensioning the endless track belt around the track driving wheel, the inside idler wheel and the outside idler wheel so that the endless track belt has a punctually localized surface contact with a ground surface.

[0010] Other objects, advantages and features of the present invention will become more apparent upon reading of the following nonrestrictive description of preferred embodiments thereof, given by way of example only with reference to the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

[0011] In the appended drawings:

[0012] Figure 1 is a side elevational view of an all-terrain vehicle provided with track assemblies according to an embodiment of the present invention;

[0013] Figure 2 is a side elevational view of the front track assembly of the vehicle of Figure 1, seen from of the outside of the all-terrain vehicle;

[0014] Figure 3 is a side elevational view of the front track assembly of the vehicle of Figure 1, seen form the inside of the all-terrain vehicle;

[0015] Figure 4 is a sectional view taken along the line 4-4 of Figure 3;

[0016] Figure 5 is an enlarged side view of an outside idler wheel attachment of the track assembly of Figure 2;

[0017] Figure 6 is a sectional view of a rigid member of the track assembly of Figure 2;

[0018] Figure 7 is a top plan view of the attachment of the front track assembly of Figure 1 to the all-terrain vehicle;

[0019] Figure 8 is a side elevational view of a rear track assembly of Figure 1, seen from the inside of the all-terrain vehicle;

[0020] Figure 9 is a top plan view of the attachment of the rear track assembly of Figure 1 to the all-terrain vehicle;

[0021] Figure 10 is a sectional view similar to Figure 4 but illustrating a second type of endless track; and

[0022] Figure 11 is a sectional view similar to Figure 4 but illustrating a third type of endless track.

DESCRIPTION OF THE EMBODIMENT

[0023] A track assembly for an all-terrain vehicle according to an embodiment of the present invention will now be described in details with reference to the appended drawings.

[0024] Figure 1 shows an all-terrain vehicle 10 comprising a body 12 and four track assemblies (only two shown) according to the present invention arranged in a plane adjacent to each side of the vehicle 10.

[0025] There are two identical track assemblies in the front of the all-terrain vehicle 10, of which only one track assembly 14 is visible in Figure 1, in place of conventional front wheels. Similarly, there are two identical track assemblies, of which only one track assembly 16 is visible in Figure 1, in place of the conventional rear wheels.

[0026] Only the track assemblies 14 and 16 visible in Figure 1 will be described hereinbelow. Furthermore, as they are symmetrical about a vertical axis 22 when viewed from the outside of the vehicle 10 (see Figure 1), only the track assemblies 14 will be described hereinbelow. It is also to be noted that the elements as seen from the outside of the vehicle 10 will bear the same

numbers in the rear track assembly 16 than the corresponding ones in the front track assembly 14, with a prime.

[0027] However, since the attachment of rear and front track assemblies differs as seen from the inside of the vehicles 10, they will be described separately.

[0028] The front track assembly 14 is better seen in Figure 2. It comprises a longitudinal endless track belt 23 and a mounting structure to mount the endless track belt 23 to the vehicle 10. The mounting structure includes a track driving wheel 24, a pair of inside idler wheels 26, a pair of outside idler wheels 28 and supports to interconnect the wheels 24, 26 and 28 as will be described hereinbelow.

[0029] The endless track belt 23 is provided with inner lugs 30 on its inner surface 31 and with external lugs 32 on its outer surface 33. It is wounded around the track driving wheel 24 and the idler wheels 28 and 26.

[0030] As can be better seen from Figure 4, the track driving wheel 24 is mounted to a conventional hub 35 of the all-terrain vehicle 10. The wheel 24 includes a first mounting plate 37 mounted to the hub 35 and a second mounting plate 34 mounted to the first plate 37 via four bolt and spacer assemblies 36. A circular disk 38 is mounted to the bolt and spacer assemblies 36 and includes equidistant wide teeth 40 contacting the inner surface 31 of the track 23.

[0031] As will be apparent to one skilled in the art, the equidistant teeth 40 are so located as to cooperate with some of the inner lugs 30 of the endless track belt 23. More precisely, as can be better seen from Figure 2, the

teeth 40 are spaced so that the distance between two consecutive teeth 40 spans the distance separating consecutive inner lugs 30 of the endless track belt 23, in a meshing engagement, in such a way as to drive the endless track belt 23.

[0032] Each of the inside idler wheels 26 includes a peripheral portion in contact with the internal surface 31 of the track 23. The wheels 26 are interconnected by a spacing element (not shown).

[0033] Similarly, each outer idler wheel 28 includes a peripheral portion in contact with the internal surface 31 of the track 23. The wheels 28 are interconnected by a spacing element 42.

[0034] The wheels 24, 26 and 28 are interconnected, as seen from the outside of the track assembly 14, by an angled connecting element 44. The angled connecting element 44 has a center portion 46 provided with an aperture 48 in which bearings 50 are mounted. A fastener 52 connects the connecting element 44 to the second plate 34 while allowing the angled connecting element 44 to pivot about the fastener.

[0035] The connecting element 44 has a short arm 54 having a free end to which the inside idler wheels 26 are rotatably mounted. The connecting element 44 also has a long arm 56 having a free end to which the inside idler wheels 28 are rotatably mounted as will be further discussed hereinbelow. The connecting element 44 is better seen from the top plan view of Figure 6.

[0036] Turning now briefly to Figure 3 of the appended drawings, as can be seen from the inside of the all-terrain vehicle 10, the idler wheels 26 and 28 of the front track assembly 14 are also directly connected together by an

elbowed connection element 58. The inside idler wheels 26 are rotatably mounted to a first end of the elbowed connection element 58 while the outside idler wheels 28 are rotatably mounted to a second end of the elbowed connection element 58.

[0037] The rotatable connection of the outside idler wheels 28 to the angle connection element 44 and to the elbowed connection element 58 will now be described with reference to Figure 5.

[0038] As will easily be understood by one skilled in the art upon inspection of Figure 5, the tension of the endless track belt 23 is adjusted by the connection of the outside idler wheels 28 to the elements 44 and 58. For concision purpose, only the connection of the wheels 28 to the elbowed connection element 58 will be described.

[0039] With reference to the enlarged side view of Figure 5, a tension adjusting assembly according to another aspect of the present invention will be described. As can be seen from this figure, a distal end of the connection element 58 includes a slotted aperture 60 receiving a fastener 62 used to rotatably mount the wheels 28 to the assembly. By sliding the fastener 62 in the aperture 60, it is possible to increase or decrease the tension on the track 23. To adjust and maintain this track tension, a cam element 64, having an outer periphery provided with notches 66 located at different distances from the attachment point of the element 64, is mounted to the fastener 62. By selecting which notch 66 is in contact with a fixed pin 68 of the element 58, a predetermined tension may be maintained. It is to be noted that the cam element 64 is provided with a handle 70 to facilitate the manipulation by a user.

[0040] Returning to Figure 4 of the appended drawings the endless track 23 will be described in greater detail.

[0041] As can be seen from Figure 4, the overall profile of the track 23, from one side to the other, i.e. transversely, is generally convex. However, the convex profile of the track 23 is created by a lug arrangement comprising two successive transverse rows of lugs arranged in a staggered relationship.

[0042] A first transverse row of lugs contains three lugs 72, 74 and 76 and a second row of lugs contains four lugs 78, 80, 82 and 84. These lugs are symmetrical about a longitudinal axis (not shown).

[0043] A first lateral lug 72 of the first row includes three ground-contacting surfaces separated by two indentations. The shape of lateral lug 72 is such that the ground contacting surfaces are generally transversally convex.

[0044] A central lug 74 is centered about longitudinal axis and includes two ground-contacting surfaces separated by an indentation. The ground contacting surfaces are symmetrical about the longitudinal axis and are generally transversally convex.

[0045] A second lateral lug 76 is a mirror image of lug 72 about the longitudinal axis.

[0046] The first and second lateral lugs 72 and 76 are laterally spaced apart from the central lug 74.

[0047] In the second transverse row of lugs, a first intermediate lug 80 includes two ground-contacting surfaces separated by an indentation. The ground engaging surfaces are slightly transversally convex.

[0048] A first external lug 78 includes two ground-contacting surfaces that are separated by an indentation and are transversally convex.

[0049] Finally, the second intermediate lug 82 and the second external lug 84 are respectively mirror images of lugs 80 and 78 with respect to the longitudinal axis. For concision purposes, these lugs will not be further described herein.

[0050] Of course, the sequences described hereinabove of the lug arrangement defined by the rows of lugs are repeated onto the entire external surface of the endless track 23.

[0051] The endless track belt 23 further includes, for each row of lugs, a stiffening rod 71, made of glass fibers for example. Each stiffening rod 71 is embedded in the material forming the track belt 23 so as to be generally parallel to the inner surface 31 thereof. The rods 71 provide enhanced rigidity to the endless track belt 23. The enhanced rigidity of the track belt 23 has many advantages. For example, it helps the track to provide adequate traction even when the center portion of the track is not in direct contact with the ground, as illustrated in Figure 4. However, it has been found that this type of traction may be detrimental to the steering of the vehicle in some conditions.

[0052] As it is apparent from Figure 4 the ground contacting surfaces of symmetrical lugs 78 and 84 are not aligned with the outer surfaces of the other lugs to form a continuous profile. Indeed, the ground contacting surfaces

of lugs 78 and 84 are more angled and exceed the convex profile defined by the other lugs. This configuration of the outer lugs is advantageous since it further prevents the vehicle from tipping over during sharp turns at high speed when the vehicle 10 is severely tilted.

[0053] As mentioned hereinabove, the way the front track assembly 14 is attached to the body 12 of the vehicle 10 differs from the way the rear track assembly 16 is attached to the body 12 of the vehicle 10. These two attachments will be described hereinbelow.

[0054] The front track assembly 14 is attached to the body 12 of the vehicle 10 in a fashion shown in Figures 4 and 7, while the rear track assembly 16 is attached to the body 12 of the vehicle 10 in a fashion shown in Figure 8 and 9.

[0055] As seen in Figures 4 and 7, the front track assembly 14 is mounted to a tubular wheel table 100 of the vehicle 10 by means of a generally triangular plate 102 fastened thereto by a plurality of U-bolts 104, 106, 108 and 110. A rod 112 is connected between the elbowed connection element 58 and a pivot 114 of the tubular wheel table 100. A first end of the rod 112 is attached to the elbowed connection element 58 by means of rubber damping elements 116, in such a way as to allow a vertical movement at this point of the rod 112 in relation to the elbowed connection element 58. A second end of the rod 112 is attached to the pivot 114 of the tubular wheel table 100 by means of an R-clip 120, in such a way as to allow at this point a horizontal movement of the plate 102 holding the tubular wheel table 100 relative to the elbowed connection element 58.

[0056] The front track assembly 14 is further attached to the body 12 of the vehicle 10 through a conventional rod 150 of the suspension system of the vehicle 10 and a conventional rod 157 used for direction (see Figure 4).

[0057] As seen in Figures 8 and 9, the rear track assembly 16 is mounted to the body 12 of the vehicle 10 by a rod 212. The rod 212 is connected on a first end to the elbowed connection element 58' by means of a rubber damping attachment 216. It is attached, on a second end, to a tubular chassis 130 of the body 12 of the vehicle 10 by means of a chipping joint 132 fastened thereto by an R-clip 134.

[0058] From the above description of the fashion in which the front and rear track assemblies 14 and 16 are mounted to the body 12 of the vehicle 10, in relation to Figures 4 and 7, and 8 and 9 respectively, the present invention provides for track assemblies that are easily removed or mounted to the vehicle 10, through using R-clips (120 and 134), which enable disconnecting the track assemblies from the vehicle in a simple manner.

[0059] As stated hereinabove, the interior surface 31 of the endless track belt 23 is provided with a plurality of equally spaced lugs 30, which ensure a positive engagement with the teeth 40 provided on the outer circumference of the wheel 24. In operation, the wheel 24 is coupled to a drive shaft, via the hub 30, connected to an engine (not shown), in such a way that the engine drives the wheel 24 in rotation. The wheel 24 thus drives the endless track belt 23 by the meshing engagement of the teeth 40 with the internal lugs 30 of the endless track belt 23.

[0060] It is further to be understood that the external lugs 32 on the external circumference surface of the endless track belt 23 respectively exert a

positive mechanical connection with the underlying ground surface that contributes to propel the vehicle 10.

[0061] Figure 10 and Figure 11 show sectional views similar to that of Figure 4 but illustrating variants of an endless track that may be mounted to the track assembly of the present invention.

[0062] In Figure 10, the overall profile of the endless track belt 23a, from one side to the other, i.e. transversely, is generally convex.

[0063] The convex profile of the endless track belt 23a is created by the same lug arrangement as that described hereinabove in relation to Figure 4. In this specific embodiment however, the endless track belt 23a does not include stiffening rods under each row of lugs. Consequently, the rigidity of the endless track belt 23a is less than the rigidity of the endless track belt 23 (Figure 4) and the profile of the endless track belt 23a conforms itself to the profile of the ground. Since the pressure is more localized in the center of the endless track belt 23a, a more punctually localized contact zone between the endless track belt 23a and the ground 29 is created. In many cases, this punctually localized contact zone makes the vehicle 10 more maneuverable.

[0064] Turning now to Figure 11, a third version of an endless track belt 23b will be described. The endless track belt 23b is wounded around the track driving wheel 24 and the idler wheels 28 and 26, is still provided with inner lugs 30 on its inner surface 31. However, its outer surface is provided with rectangular lugs 86. Since there are no stiffening rods in the endless track belt 23b, the endless track belt 23b is free to conform itself to the ground 29, as seen in Figure 11. Furthermore, since the pressure is exerted only in the middle

of the endless track belt 23b by the wide teeth 40, a punctually localized contact zone between the endless track belt 23b and the ground 29 is created.

[0065] As will be apparent to one skilled in the art, the endless track belts 23a has a particularly punctually localized contact surface with the ground 29. Indeed, since it is transversally convex, it generally contacts the ground 29 with a limited surface at any given time when the ground 29 is hard.

[0066] Furthermore, since there are no guiding rails for the endless track belts 23, 23a or 23b, the external lugs only exert a pressure on the ground 29, when it is hard, in the vicinity of the wide teeth 40 of the wheel 24. These two combined features improve the maneuverability of the vehicle since it emulates the contact of a conventional tire onto hard ground, given that a shortened length of contact of the endless track with the ground surface reduces the resistance to a turning force.

[0067] Of course, one skilled in the art could design another convex profile of the external lugs of the endless track belts 23 and/or another arrangement of the mounting assembly of the endless track belts 23 to the vehicle 10 to obtain this “one point contact" feature. For example, one could provide a guiding rail having a convex profile and transversally convex lugs to achieve similar results.

[0068] As people in the art will understand, the all-terrain vehicle of the present invention, provided with four endless track assemblies, can be used for a wide range of operations and terrain, while being highly mobile and offering good running performance.

[0069] The endless track structure maintains an adequate configuration over a variety of surfaces.

[0070] It will be obvious to people skilled in the art that the present invention can be applied both in the case of a two-wheel drive vehicle wherein the power is typically applied only to the rear track belt assemblies and the front track assemblies merely facilitate steering, and in the case of a four-wheel vehicle, wherein power is independently provided to each one of the four track assemblies.

[0071] As will be further understood by one skilled in the art, the all-terrain vehicle 10, equipped with track assemblies according to the present invention, may be viewed as a snow vehicle since it may be used on snow as efficiently as conventional snow vehicles such as snowmobiles, for example. However, the one-point contact feature of the present invention allows the use of the all-terrain vehicle on harder surface without the usual drawbacks of tracked vehicles.

[0072] Interestingly, the present track assembly system can equip all four wheels of an all-terrain vehicle or only the front or rear wheels thereof, since it only weakly reduces the speed of the vehicle relative to the underground surface.

[0073] A further possibility would be to use track assemblies according to the present invention in place of the rear wheels of a vehicle, while mounting skis in place of the front wheels thereof.

[0074] Although the present invention has been described hereinabove by way of preferred embodiments thereof, it can be modified,

and remain within the scope of the invention as defined in the appended claims.

CLAIMS:

1) A track assembly for a reduced-size vehicle designed primarily for off-highway usage, over undeveloped roads or other unprepared surfaces, the track assembly having a leading end and a trailing end and comprising:
   a) an endless track having an outer ground engaging surface and an opposite inner surface; and
   b) a plurality of wheels for supporting and driving the endless track, the plurality of wheels including:
      i) a leading idler and a trailing idler, the leading and trailing idlers being in a spaced apart relationship, a segment of the endless track extending between the leading and trailing idlers defining a ground engaging run, the leading idler having a first axis of rotation, the trailing idler having a second axis of rotation; and
      ii) a drive wheel having a third axis of rotation, the drive wheel being in driving engagement with the endless track for imparting movement to the endless track, the drive wheel overlapping with one of the leading idler and the trailing idler when viewed in a plane normal to the third axis of rotation.

2) A track assembly as defined in claim 1, comprising a support structure having:
   a) a center portion rotatably supported at the third axis of rotation;
   b) a first support arm mounted to the center portion and extending along a radial direction of the drive wheel toward the leading idler of the track assembly; and
   c) a second support arm mounted to the center portion and extending along a radial direction of the drive wheel toward the trailing idler of the track assembly.

3) A track assembly as defined in claim 2, wherein the first support arm defines a first angle with an imaginary horizontal axis which extends through the third axis

of rotation, the second support arm defines a second angle with the imaginary horizontal axis, the first angle being different from the second angle.

4) A track assembly as defined in any one of claims 1 to 3, wherein the drive wheel is in rolling contact with the inner surface of the ground engaging run.

5) A track assembly as defined in any one of claims 1 to 4, wherein the drive wheel is in overlapping relationship with the trailing idler, when viewed in a plane normal to the third axis of rotation.

6) A track assembly as defined in claim 2, wherein one of the first and second support arms is longer than the other of the first and second support arms.

7) A track assembly as defined in claim 2, wherein the first support arm and the second support arm define an obtuse angle therebetween.

8) A track assembly as defined in any one of claims 1 to 7, wherein the endless track is free of stiffening rods extending in a transverse direction of the endless track.

9) A track assembly as defined in any one of claims 1 to 8, wherein the profile of the endless track in a transverse direction of the endless track is generally convex.

10) A track assembly as defined in any one of claims 1 to 9, wherein the endless track comprises drive lugs projecting from the inner surface for engagement by the drive wheel.

11) A track assembly as defined in any one of claims 1 to 10, wherein the endless track has a pair of opposite lateral edge portions and a central portion between

the lateral edge portions, the opposite lateral edge portions being free of stiffening rods extending in a transverse direction of the endless track.

12) A track assembly as defined in claim 11, wherein the central portion includes one or more stiffening rods extending in a transverse direction of the endless track, the one or more stiffening rods being shorter than a transverse dimension of the endless track.

13) A track assembly as defined in any one of claims 1 to 7, wherein the endless track includes a plurality of track segments, each track segment including a drive lug extending inwardly from the inner surface for engaging the drive wheel, and a traction projection projecting from the outer ground engaging surface, the drive lug registering in a longitudinal direction of the endless track with the traction projection, the portion of the track segment defined between the drive lug and the traction projection being free of a stiffening rod extending transversally of the endless track.

14) A track assembly as defined in any one of claims 1 to 7, wherein the endless track comprises a plurality of drive lugs longitudinally spaced apart along the track for sequentially engaging the drive wheel such that rotation of the drive wheel imparts motion to the endless track to propel the vehicle, the endless track comprising a plurality of traction projections projecting from the outer ground engaging surface, the traction projections being longitudinally spaced apart and registering with respective drive lugs, the endless track being free of stiffening rods extending transversally of the endless track at locations of the endless track at which a drive lug registers with a traction projection.

15) A track assembly as defined in any one of claims 1 to 14, wherein the third axis of rotation is located above the first axis of rotation and the second axis of rotation.

16)A track assembly as defined in any one of claims 1 to 15, wherein the drive wheel has a periphery bound between a first upper horizontal imaginary plane and a first lower horizontal imaginary plane, one of the leading and trailing idlers having a periphery bound between a second upper horizontal imaginary plane and a second lower horizontal imaginary plane, the first lower horizontal imaginary plane being positioned below the second upper horizontal imaginary plane.

17)A track assembly as defined in any one of claims 1 to 16, wherein the drive wheel has a periphery bound between a first upper horizontal imaginary plane and a first lower horizontal imaginary plane, the leading idler having a periphery bound between a second upper horizontal imaginary plane and a second lower horizontal imaginary plane, the trailing idler having a periphery bound between a third upper horizontal imaginary plane and a third lower horizontal imaginary plane, the first lower horizontal imaginary plane being positioned below the second upper horizontal imaginary plane and below the third upper horizontal imaginary plane.

18)A track assembly as defined in any one of claims 1 to 17, wherein the plurality of wheels imparts a generally triangular path of travel to the endless track.

19)A track assembly as defined in any one of claims 1 to 18, wherein the plurality of wheels defines a track supporting and guiding arrangement that is in rolling contact with the inner surface at a plurality of locations.

20)A track assembly as defined in any one of claims 1 to 19, wherein the drive wheel has an extent along the third axis of rotation that is less than a transverse dimension of the endless track.

21)A track assembly as defined in any one of claims 1 to 20, wherein the drive wheel has a periphery extending between a periphery and an axis of rotation of the one of the leading idler and the trailing idler.

22)A track assembly as defined in any one of claims 1 to 21, wherein the track assembly is steerable by changing an orientation of the track assembly by a steering mechanism of the vehicle.

23)A set of track assemblies for a reduced-size vehicle designed primarily for off-highway usage, over undeveloped roads or other unprepared surfaces, wherein each of at least two of the track assemblies is as defined in any one of claims 1 to 22.

24)A reduced-size vehicle designed primarily for off-highway usage, over undeveloped roads or other unprepared surfaces, the reduced size vehicle including a track assembly as defined in any one of claims 1 to 22.

25) A reduced-size vehicle as defined in claim 24, wherein the vehicle is an all-terrain vehicle (ATV).

26)A reduced-size vehicle as defined in claim 25, wherein the ATV comprises handlebars.

27)A reduced-size vehicle designed primarily for off-highway usage, over undeveloped roads or other unprepared surfaces, the reduced size vehicle including a set of track assemblies as defined in claim 23.

28) A reduced-size vehicle as defined in claim 27, wherein the vehicle is an all-terrain vehicle (ATV).

29)A reduced-size vehicle as defined in claim 28, wherein the ATV comprises handlebars.

30)An all-terrain vehicle (ATV) comprising two track assemblies as defined in any one of claims 1 to 22, the two track assemblies being mounted on a common axle of the ATV.

31)An all-terrain vehicle (ATV) comprising two steerable track assemblies as defined in claim 22, wherein the steering mechanism includes a rod for controlling an angular orientation of at least one of the two steerable track assemblies, the rod being coupled to the at least one of the two steerable track assemblies.

32)A track assembly for a reduced-size vehicle designed primarily for off-highway usage, over undeveloped roads or other unprepared surfaces, the track assembly comprising:

a) an endless track having an outer ground engaging surface and an opposite inner surface; and

b) a plurality of wheels for supporting and driving the endless track, the plurality of wheels including:

i) an idler having a first axis of rotation; and

ii) a drive wheel having a second axis of rotation, the drive wheel being in driving engagement with the endless track for imparting movement to the endless track;

the sum of a radius of the idler and a radius of the drive wheel exceeding a distance between the first axis of rotation and the second axis of rotation.

33)A track assembly as defined in claim 32, wherein the idler is a trailing idler, the plurality of wheels including a leading idler in a spaced apart relationship with the trailing idler.

34)A track assembly as defined in claim 33, including a support structure having:

a) a center portion rotatably supported at the second axis of rotation;

b) a first support arm mounted to the center portion and extending along a radial direction of the drive wheel toward the leading idler;

c) a second support arm mounted to the center portion and extending along a radial direction of the drive wheel toward the trailing idler.

35)A track assembly as defined in claim 34, wherein the first support arm defines a first angle with an imaginary horizontal axis which extends through the second axis of rotation, the second support arms defines a second angle with the imaginary horizontal axis, the first angle being different from the second angle.

36)A track assembly as defined in any one of claims 33 to 35, wherein the drive wheel is in rolling contact with the inner surface of a ground engaging run of the endless track defined between the leading idler and the trailing idler.

37)A track assembly as defined in claim 34, wherein one of the first and second support arms is longer than the other of the first and second support arms.

38)A track assembly as defined in claim 34, wherein the first support arm and the second support arm define an obtuse angle therebetween.

39)A track assembly as defined in any one of claims 32 to 38, wherein the endless track is free of stiffening rods extending in a transverse direction of the endless track.

40)A track assembly as defined in any one of claims 32 to 39, wherein the profile of the endless track in a transverse direction of the endless track is generally convex.

41)A track assembly as defined in any one of claims 32 to 40, wherein the endless track comprises drive lugs projecting from the inner surface for engagement by the drive wheel.

42)A track assembly as defined in any one of claims 32 to 38, wherein the endless track has a pair of opposite lateral edge portions and a central portion between the lateral edge portions, the opposite lateral edge portions being free of stiffening rods extending in a transverse direction of the endless track.

43)A track assembly as defined in claim 42, wherein the central portion includes one or more stiffening rods extending in a transverse direction of the endless track, the one or more stiffening rods being shorter than a transverse dimension of the endless track.

44)A track assembly as defined in any one of claims 32 to 38, wherein the endless track includes a plurality of track segments, each track segment including a drive lug extending inwardly from the inner surface for engaging the drive wheel, and a traction projection projecting from the outer ground engaging surface, the drive lug registering in a longitudinal direction of the endless track with the traction projection, the portion of the track segment defined between the drive lug and the traction projection being free of a stiffening rod extending transversally of the endless track.

45)A track assembly as defined in any one of claims 32 to 38, wherein the endless track comprises a plurality of drive lugs longitudinally spaced apart along the track for sequentially engaging the drive wheel such that rotation of the drive wheel imparts motion to the endless track to propel the vehicle, the endless track comprising a plurality of traction projections projecting from the outer ground engaging surface, the traction projections being longitudinally spaced apart and registering with respective drive lugs, the endless track being free of stiffening

rods extending transversally of the endless track at locations of the endless track at which a drive lug registers with a traction projection.

46)A track assembly as defined in any one of claims 32 to 45, wherein the second axis of rotation is located above the first axis of rotation.

47)A track assembly as defined in any one of claims 33 to 46, wherein the drive wheel has a periphery bound between a first upper horizontal imaginary plane and a first lower horizontal imaginary plane, one of the leading and trailing idlers having a periphery bound between a second upper horizontal imaginary plane and a second lower horizontal imaginary plane, the first lower horizontal imaginary plane being positioned below the second upper horizontal imaginary plane.

48)A track assembly as defined in any one of claims 33 to 46, wherein the drive wheel has a periphery bound between a first upper horizontal imaginary plane and a first lower horizontal imaginary plane, the leading idler having a periphery bound between a second upper horizontal imaginary plane and a second lower horizontal imaginary plane, the trailing idler having a periphery bound between a third upper horizontal imaginary plane and a third lower horizontal imaginary plane, the first lower horizontal imaginary plane being positioned below the second upper horizontal imaginary plane and below the third upper horizontal imaginary plane.

49)A track assembly as defined in any one of claims 32 to 48, wherein the plurality of wheels imparts a generally triangular path of travel to the endless track.

50)A track assembly as defined in any one of claims 32 to 49, wherein the drive wheel has an extent along the second axis of rotation that is less than a transverse dimension of the endless track.

51)A track assembly as defined in any one of claims 32 to 50, wherein the track assembly is steerable by changing an orientation of the track assembly by a steering mechanism of the vehicle.

52)A set of track assemblies for a reduced-size vehicle designed primarily for off-highway usage, over undeveloped roads or other unprepared surfaces, wherein each of at least two of the track assemblies is as defined in any one of claims 32 to 51.

53)A reduced-size vehicle designed primarily for off-highway usage, over undeveloped roads or other unprepared surfaces, the reduced size vehicle including a track assembly as defined in any one of claims 32 to 51.

54) A reduced-size vehicle as defined in claim 53, wherein the vehicle is an all-terrain vehicle (ATV).

55)A reduced-size vehicle as defined in claim 54, wherein the ATV comprises handlebars.

56)A reduced-size vehicle designed primarily for off-highway usage, over undeveloped roads or other unprepared surfaces, the reduced size vehicle including a set of track assemblies as defined in claim 52.

57) A reduced-size vehicle as defined in claim 56, wherein the vehicle is an all-terrain vehicle (ATV).

58)A reduced-size vehicle as defined in claim 57, wherein the ATV comprises handlebars.

59) An all-terrain vehicle (ATV) comprising two track assemblies as defined in any one of claims 32 to 51, the two track assemblies being mounted on a common axle of the ATV.

60) An all-terrain vehicle (ATV) comprising two steerable track assemblies as defined in claim 51, wherein the steering mechanism includes a rod for controlling an angular orientation of at least one of the two steerable track assemblies, the rod being coupled to the at least one of the two steerable track assemblies.

61) A track assembly for providing traction to an all-terrain vehicle (ATV), the track assembly being configured to replace a ground-engaging wheel of the ATV, the track assembly comprising:

a) a plurality of wheels including:
   - a drive wheel; and
   - a leading idler wheel and a trailing idler wheel spaced apart from the leading idler wheel in a longitudinal direction of the track assembly; the drive wheel and a given one of the leading idler wheel and the trailing idler wheel overlapping in the longitudinal direction of the track assembly; and

b) an endless track disposed around the plurality of wheels and comprising:
   - an inner surface for facing the plurality of wheels, the drive wheel being rotatable to impart motion ~~of~~ to the endless track;
   - a ground-engaging outer surface opposite to the inner surface; and
   - a plurality of traction projections projecting from the ground-engaging outer surface.

62) A track assembly as defined in claim 61, wherein the given one of the leading idler wheel and the trailing idler wheel is the trailing idler wheel.

63)A track assembly as defined in any one of claims 61 and 62, wherein a distance between an axis of rotation of the drive wheel and an axis of rotation of the leading idler wheel in the longitudinal direction of the track assembly is different from a distance between the axis of rotation of the drive wheel and an axis of rotation of the trailing idler wheel in the longitudinal direction of the track assembly.

64)A track assembly as defined in claim 63, wherein the distance between the axis of rotation of the drive wheel and the axis of rotation of the leading idler wheel in the longitudinal direction of the track assembly is greater than the distance between the axis of rotation of the drive wheel and the axis of rotation of the trailing idler wheel in the longitudinal direction of the track assembly.

65)A track assembly as defined in any one of claims 61 to 64, comprising a support structure supporting the leading idler wheel and the trailing idler wheel and comprising a first arm extending downwardly and forwardly towards the leading idler wheel and a second arm extending downwardly and rearwardly towards the trailing idler wheel.

66)A track assembly as defined in claim 65, wherein the first arm is longer than the second arm.

67)A track assembly as defined in any one of claims 61 to 66, wherein the drive wheel engages a bottom run of the endless track that extends between the leading idler wheel and the trailing idler wheel.

68)A track assembly as defined in any one of claims 61 to 67, wherein the endless track is free of stiffening rods extending transversally to a longitudinal direction of the endless track.

69)A track assembly as defined in any one of claims 61 to 68, wherein a profile of the endless track in a transversal direction of the endless track is generally convex.

70)A track assembly as defined in any one of claims 61 to 69, wherein the endless track comprises a plurality of drive lugs projecting from the inner surface for engaging the drive wheel.

71) A track assembly as defined in any one of claims 61 to 67, wherein the endless track has a pair of lateral edge portions and a central portion between the lateral edge portions, the lateral edge portions being free of stiffening rods extending transversally to a longitudinal direction of the endless track.

72)A track assembly as defined in claim 71, wherein the central portion includes one or more stiffening rods extending transversally to the longitudinal direction of the endless track and shorter than a transverse dimension of the endless track.

73)A track assembly as defined in any one of claims 61 to 67, wherein the endless track includes a plurality of track segments, each track segment including (i) a drive lug projecting from the inner surface to engage the drive wheel and (ii) a given one of the traction projections that registers with the drive lug in a longitudinal direction of the endless track, the track segment being free of a stiffening rod extending transversally of the endless track between the drive lug and the given one of the traction projections.

74)A track assembly as defined in any one of claims 61 to 67, wherein the endless track comprises a plurality of drive lugs projecting from the inner surface for engaging the drive wheel, the drive lugs registering with respective ones of the traction projections in a longitudinal direction of the endless track, the endless

track being free of stiffening rods extending transversally of the endless track at locations at which a drive lug registers with a traction projection.

75) A track assembly as defined in any one of claims 61 to 74, wherein the drive wheel has a periphery bound between a first upper horizontal imaginary plane and a first lower horizontal imaginary plane, the leading idler wheel having a periphery bound between a second upper horizontal imaginary plane and a second lower horizontal imaginary plane, the trailing idler wheel having a periphery bound between a third upper horizontal imaginary plane and a third lower horizontal imaginary plane, the first lower horizontal imaginary plane being positioned below the second upper horizontal imaginary plane and below the third upper horizontal imaginary plane.

76) A track assembly as defined in any one of claims 61 to 75, wherein the plurality of wheels imparts a generally triangular path of travel to the endless track.

77) A track assembly as defined in any one of claims 61 to 76, wherein the drive wheel has an extent along an axis of rotation of the drive wheel that is less than a transverse dimension of the endless track.

78) A track assembly as defined in any one of claims 61 to 77, wherein the track assembly is steerable by a steering mechanism of the ATV to change an orientation of the track assembly in order to steer the ATV.

79) A set of track assemblies for providing traction to an all-terrain vehicle (ATV), wherein at least two of the track assemblies are as defined in any one of claims 61 to 78.

80) An all-terrain vehicle (ATV) comprising a track assembly as defined in any one of claims 61 to 78.

81)An all-terrain vehicle (ATV) comprising a track assembly as defined in claim 78, wherein the steering mechanism of the ATV comprises handlebars.

82)An all-terrain vehicle (ATV) comprising a set of track assemblies as defined in claim 79.

83)An ATV as defined in claim 81, wherein the steering mechanism includes a rod coupled to the track assembly for controlling an angular orientation of the track assembly.

84)A track assembly for providing traction to a vehicle, the track assembly comprising:

a) a plurality of wheels which includes:

- a drive wheel; and
- a leading idler wheel and a trailing idler wheel;

an axis of rotation of the drive wheel being located between an axis of rotation of the leading idler wheel and an axis of rotation of the trailing idler wheel in a longitudinal direction of the track assembly, the drive wheel overlapping with a given one of the leading idler wheel and the trailing idler wheel when viewed in a direction parallel to the axis of rotation of the drive wheel; and

b) a track disposed around the wheels, the track comprising flexible material to flex around the wheels, the track comprising:

- an inner surface for facing the wheels;
- a ground-engaging outer surface opposite to the inner surface;
- a plurality of traction projections projecting from the ground-engaging outer surface and distributed in a longitudinal direction of the track;

a bottom run of the track extending under the leading idler wheel and the trailing idler wheel, the bottom run of the track comprising:

- an intermediate section located between the leading idler wheel and the trailing idler wheel;
- a leading section rising from the intermediate section and extending towards the leading idler wheel; and
- a trailing section rising from the intermediate section and extending towards the trailing idler wheel.

85) A track assembly as defined in claim 84, wherein the given one of the leading idler wheel and the trailing idler wheel is the trailing idler wheel.

86) A track assembly as defined in any one of claims 84 and 85, wherein a distance between the axis of rotation of the drive wheel and the axis of rotation of the leading idler wheel in the longitudinal direction of the track assembly is different from a distance between the axis of rotation of the drive wheel and an axis of rotation of the trailing idler wheel in the longitudinal direction of the track assembly.

87) A track assembly as defined in claim 86, wherein the distance between the axis of rotation of the drive wheel and the axis of rotation of the leading idler wheel in the longitudinal direction of the track assembly is greater than the distance between the axis of rotation of the drive wheel and the axis of rotation of the trailing idler wheel in the longitudinal direction of the track assembly.

88) A track assembly as defined in any one of claims 84 to 87, comprising a support structure supporting the leading idler wheel and the trailing idler wheel and comprising a first arm extending downwardly and forwardly towards the leading idler wheel and a second arm extending downwardly and rearwardly towards the trailing idler wheel.

89)A track assembly as defined in claim 88, wherein the first arm is longer than the second arm.

90)A track assembly as defined in any one of claims 84 to 89, wherein the drive wheel engages the bottom run of the track.

91)A track assembly as defined in any one of claims 84 to 90, wherein the endless track is free of stiffening members extending transversally to the longitudinal direction of the track.

92)A track assembly as defined in any one of claims 84 to 91, wherein a profile of the track in a transversal direction of the track is generally convex.

93)A track assembly as defined in any one of claims 84 to 92, wherein the track comprises a plurality of drive lugs projecting from the inner surface for engaging the drive wheel.

94) A track assembly as defined in any one of claims 84 to 90, wherein the track has a pair of lateral edge portions and a central portion between the lateral edge portions, the lateral edge portions being free of stiffening members extending transversally to the longitudinal direction of the track.

95)A track assembly as defined in claim 94, wherein the central portion includes one or more stiffening rods extending transversally to the longitudinal direction of the track and shorter than a transverse dimension of the track.

96)A track assembly as defined in any one of claims 84 to 90, wherein the track is free of stiffening members at locations of respective ones of the traction projections in the longitudinal direction of the track.

97) A track assembly as defined in any one of claims 84 to 90, wherein the track comprises a plurality of drive lugs projecting from the inner surface for engaging the drive wheel, the drive lugs registering with respective ones of the traction projections in the longitudinal direction of the track, the track being free of stiffening members extending transversally of the track at locations at which a drive lug registers with a traction projection.

98) A track assembly as defined in any one of claims 84 to 97, wherein the drive wheel has an extent along the axis of rotation of the drive wheel that is less than a transverse dimension of the track.

99) A track assembly as defined in any one of claims 84 to 98, wherein an extent of the intermediate section of the bottom run of the track in the longitudinal direction of the track assembly does not exceed a diameter of the drive wheel.

100) A track assembly as defined in claim 99, wherein the extent of the intermediate section of the bottom run of the track in the longitudinal direction of the track assembly does not exceed a radius of the drive wheel.

101) A track assembly as defined in any one of claims 84 to 100, wherein the track assembly is steerable by a steering mechanism of the vehicle to change an orientation of the track assembly in order to steer the vehicle.

102) A track assembly as defined in any one of claims 84 to 101, wherein the vehicle is an all-terrain vehicle (ATV).

103) A track assembly as defined in claim 102, wherein the ATV comprises a straddle seat and handlebars.

104) A set of track assemblies for providing traction to a vehicle, wherein at least two of the track assemblies are as defined in any one of claims 84 to 103.

105) A vehicle comprising a track assembly as defined in any one of claims 84 to 101.

106) A vehicle as defined in claim 105, wherein the vehicle is an all-terrain vehicle (ATV).

107) A vehicle as defined in claim 106, wherein the ATV comprises a straddle seat and handlebars.

108) A vehicle comprising a set of track assemblies as defined in claim 104.

109) A vehicle as defined in claim 108, wherein the vehicle is an all-terrain vehicle (ATV).

110) A vehicle as defined in claim 109, wherein the ATV comprises a straddle seat and handlebars.

111) A track assembly for providing traction to a vehicle, the track assembly comprising:

a) a plurality of wheels which includes:

- a drive wheel; and
- a leading idler wheel and a trailing idler wheel;

an axis of rotation of the drive wheel being located between an axis of rotation of the leading idler wheel and an axis of rotation of the trailing idler wheel in a longitudinal direction of the track assembly, a distance between the axis of rotation of the drive wheel and the axis of rotation of the leading idler wheel in the longitudinal direction of the track assembly being different from a distance

between the axis of rotation of the drive wheel and the axis of rotation of the trailing idler wheel in the longitudinal direction of the track assembly, the drive wheel overlapping with a given one of the leading idler wheel and the trailing idler wheel when viewed in a direction parallel to the axis of rotation of the drive wheel; and

b) a track disposed around the wheels, the track comprising flexible material to flex around the wheels, the track comprising:

- an inner surface for facing the wheels;
- a ground-engaging outer surface opposite to the inner surface;
- a plurality of traction projections projecting from the ground-engaging outer surface and distributed in a longitudinal direction of the track;

a bottom run of the track extending under the leading idler wheel and the trailing idler wheel.

112) A track assembly as defined in claim 111, wherein the given one of the leading idler wheel and the trailing idler wheel is the trailing idler wheel.

113) A track assembly as defined in any one of claims 111 and 112, wherein the distance between the axis of rotation of the drive wheel and the axis of rotation of the leading idler wheel in the longitudinal direction of the track assembly is greater than the distance between the axis of rotation of the drive wheel and the axis of rotation of the trailing idler wheel in the longitudinal direction of the track assembly.

114) A track assembly as defined in any one of claims 111 to 113, comprising a support structure supporting the leading idler wheel and the trailing idler wheel and comprising a first arm extending downwardly and forwardly towards the leading idler wheel and a second arm extending downwardly and rearwardly towards the trailing idler wheel.

115) A track assembly as defined in claim 114, wherein the first arm is longer than the second arm.

116) A track assembly as defined in any one of claims 111 to 115, wherein the drive wheel engages the bottom run of the track.

117) A track assembly as defined in any one of claims 111 to 116, wherein the endless track is free of stiffening members extending transversally to the longitudinal direction of the track.

118) A track assembly as defined in any one of claims 111 to 117, wherein a profile of the track in a transversal direction of the track is generally convex.

119) A track assembly as defined in any one of claims 111 to 118, wherein the track comprises a plurality of drive lugs projecting from the inner surface for engaging the drive wheel.

120) A track assembly as defined in any one of claims 111 to 116, wherein the track has a pair of lateral edge portions and a central portion between the lateral edge portions, the lateral edge portions being free of stiffening members extending transversally to the longitudinal direction of the track.

121) A track assembly as defined in claim 120, wherein the central portion includes one or more stiffening rods extending transversally to the longitudinal direction of the track and shorter than a transverse dimension of the track.

122) A track assembly as defined in any one of claims 111 to 116, wherein the track is free of stiffening members at locations of respective ones of the traction projections in the longitudinal direction of the track.

123) A track assembly as defined in any one of claims 111 to 116, wherein the track comprises a plurality of drive lugs projecting from the inner surface for engaging the drive wheel, the drive lugs registering with respective ones of the traction projections in the longitudinal direction of the track, the track being free of stiffening members extending transversally of the track at locations at which a drive lug registers with a traction projection.

124) A track assembly as defined in any one of claims 111 to 123, wherein the drive wheel has an extent along the axis of rotation of the drive wheel that is less than a transverse dimension of the track.

125) A track assembly as defined in any one of claims 111 to 124, wherein the bottom run of the track comprises an intermediate section located between the leading idler wheel and the trailing idler wheel, a leading section rising from the intermediate section and extending towards the leading idler wheel, and a trailing section rising from the intermediate section and extending towards the trailing idler wheel.

126) A track assembly as defined in claim 125, wherein an extent of the intermediate section of the bottom run of the track in the longitudinal direction of the track assembly does not exceed a diameter of the drive wheel.

127) A track assembly as defined in claim 126, wherein the extent of the intermediate section of the bottom run of the track in the longitudinal direction of the track assembly does not exceed a radius of the drive wheel.

128) A track assembly as defined in any one of claims 111 to 127, wherein the track assembly is steerable by a steering mechanism of the vehicle to change an orientation of the track assembly in order to steer the vehicle.

129) A track assembly as defined in any one of claims 111 to 128, wherein the vehicle is an all-terrain vehicle (ATV).

130) A track assembly as defined in claim 129, wherein the ATV comprises a straddle seat and handlebars.

131) A set of track assemblies for providing traction to a vehicle, wherein at least two of the track assemblies are as defined in any one of claims 111 to 128.

132) A vehicle comprising a track assembly as defined in any one of claims 111 to 128.

133) A vehicle as defined in claim 132, wherein the vehicle is an all-terrain vehicle (ATV).

134) A vehicle as defined in claim 133, wherein the ATV comprises a straddle seat and handlebars.

135) A vehicle comprising a set of track assemblies as defined in claim 131.

136) A vehicle as defined in claim 135, wherein the vehicle is an all-terrain vehicle (ATV).

137) A vehicle as defined in claim 136, wherein the ATV comprises a straddle seat and handlebars.

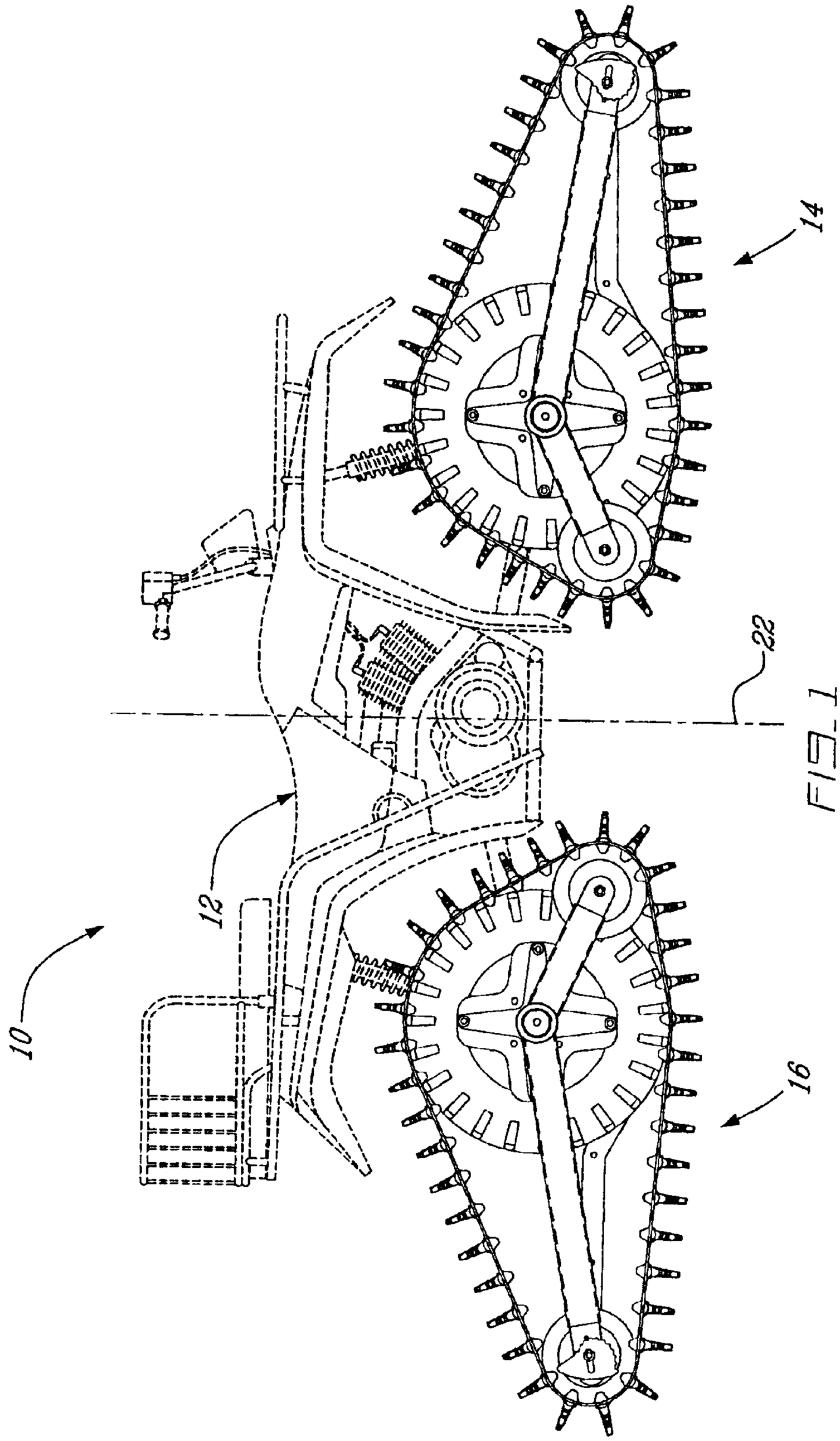


FIG. 1

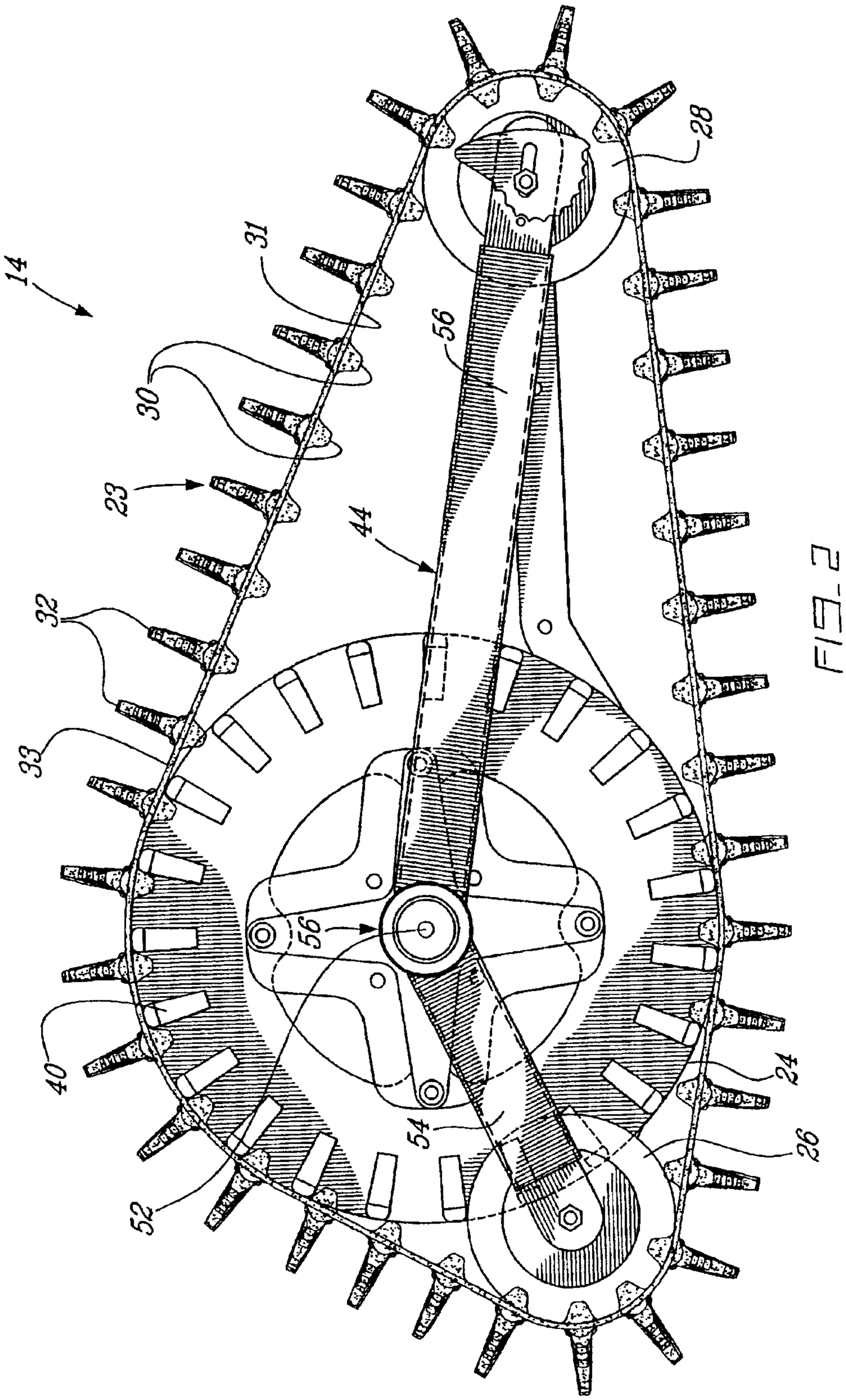


FIG. 2

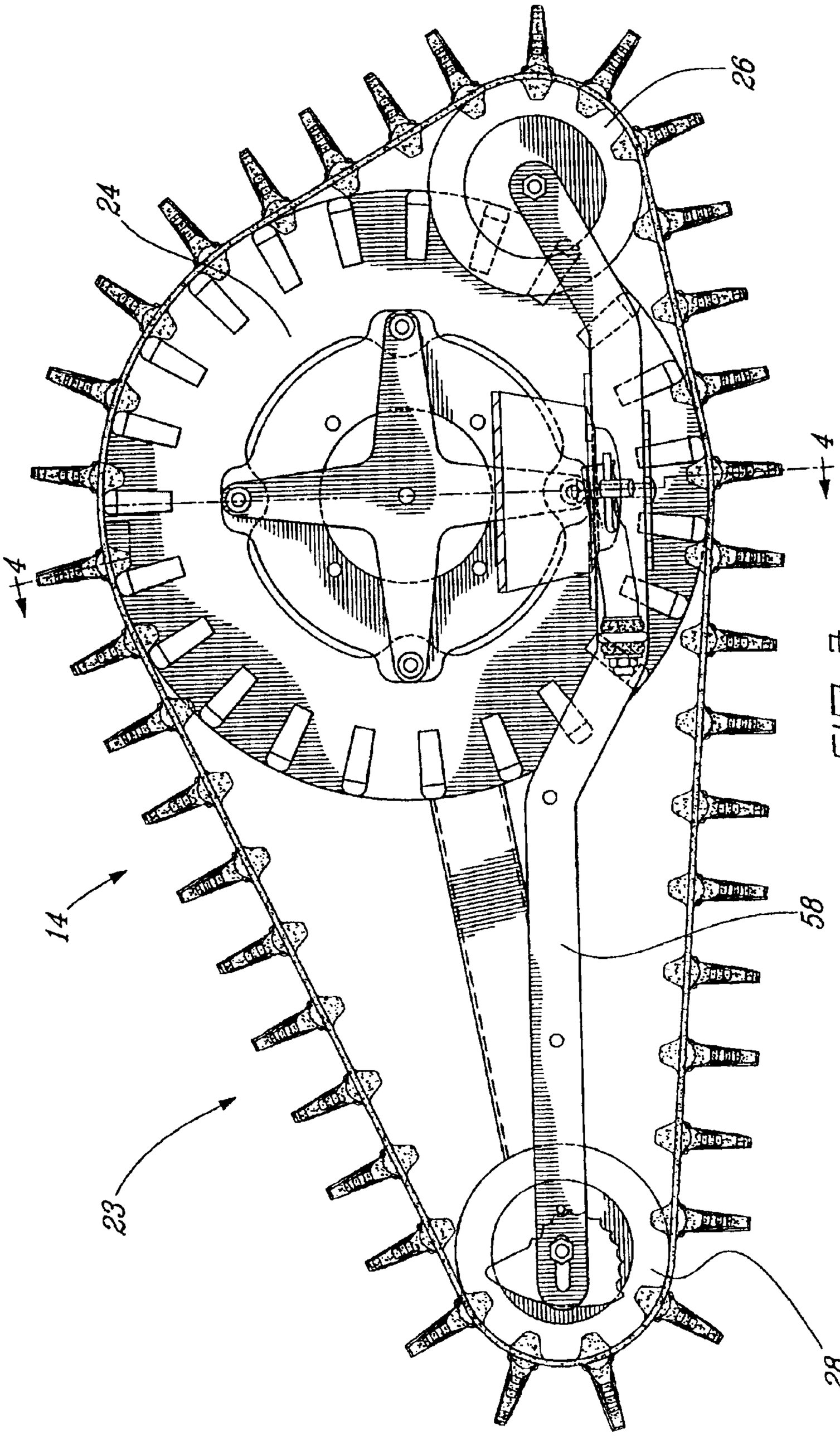


FIG. 3

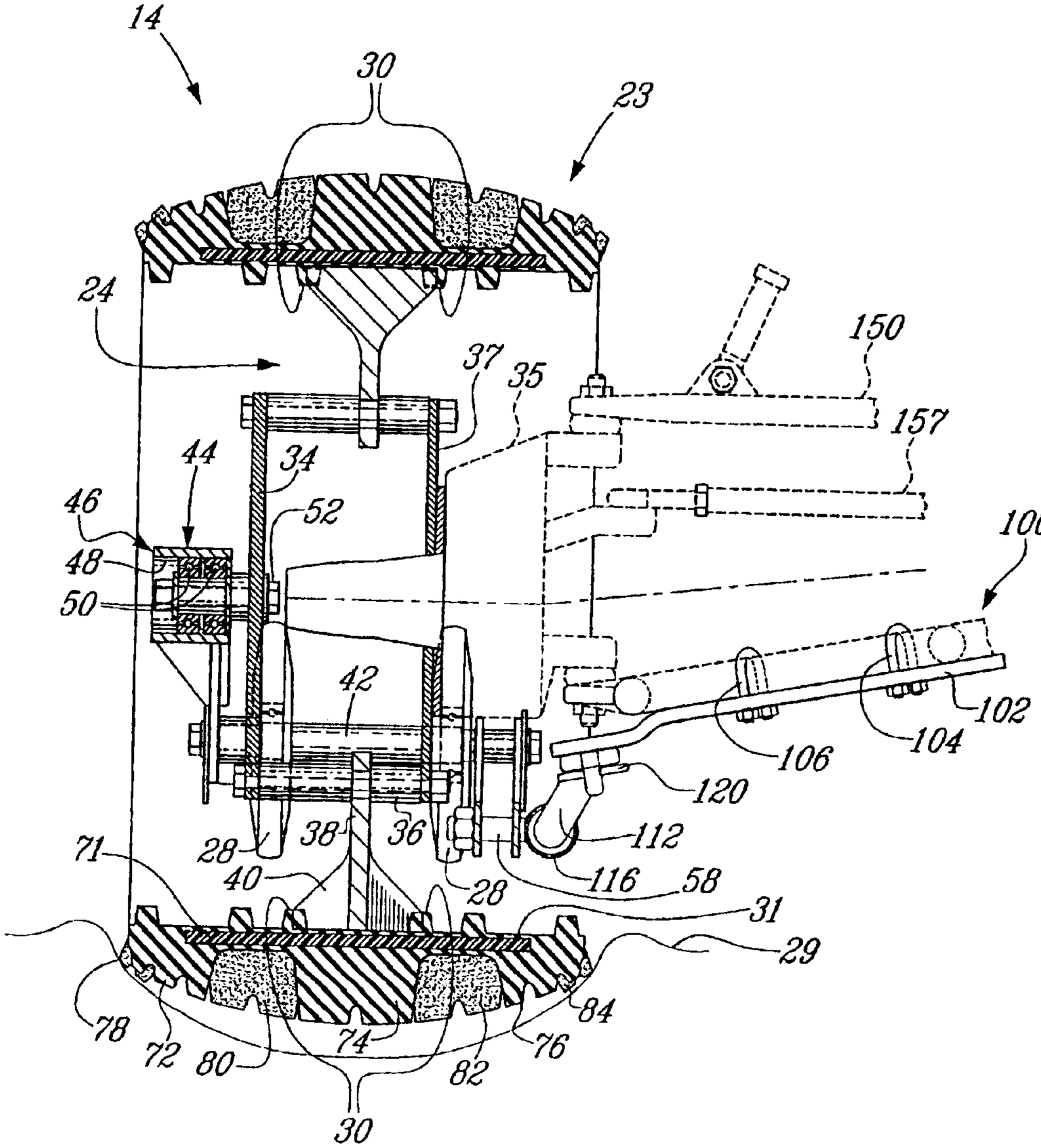

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FIG. 4

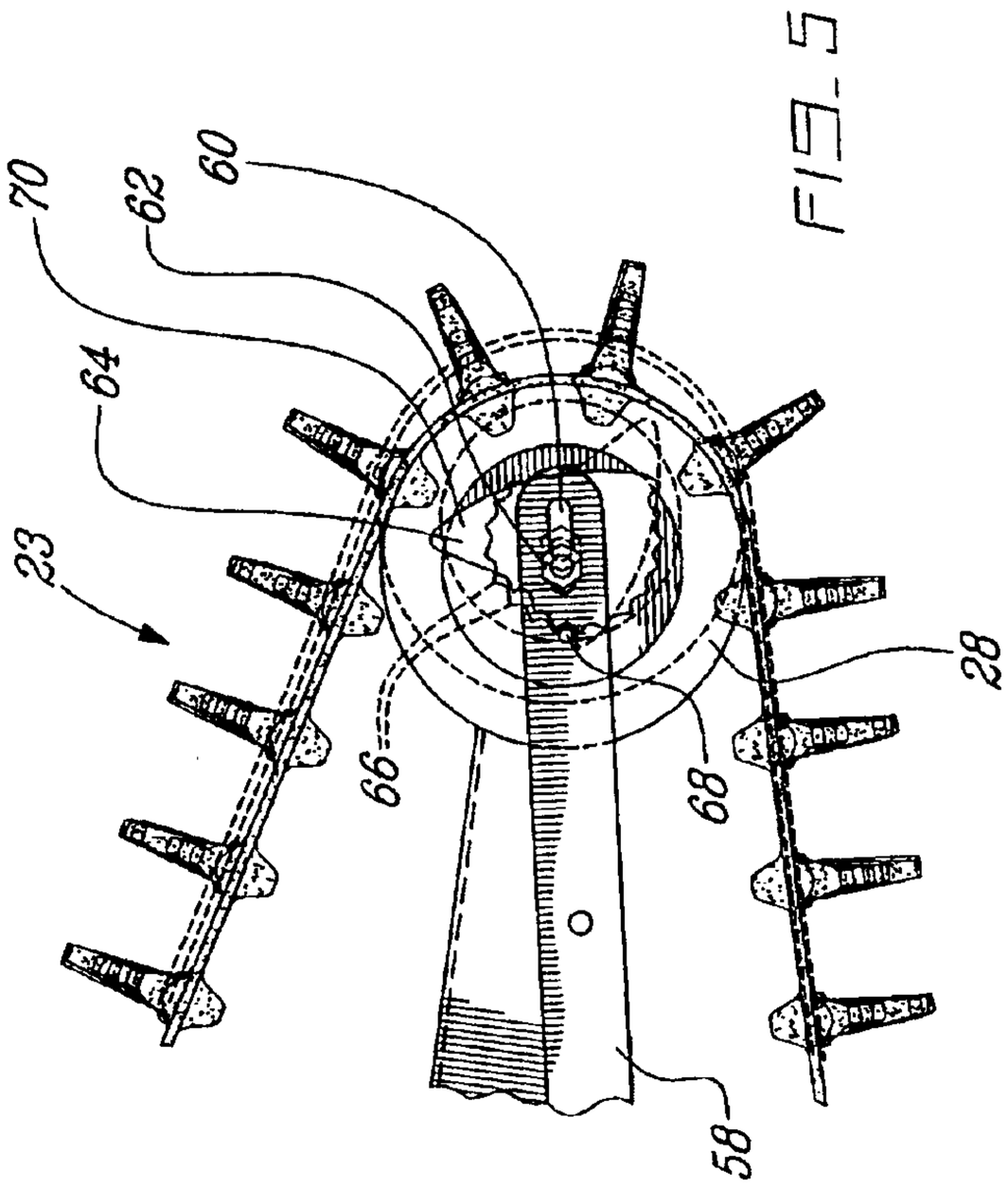


FIG. 5

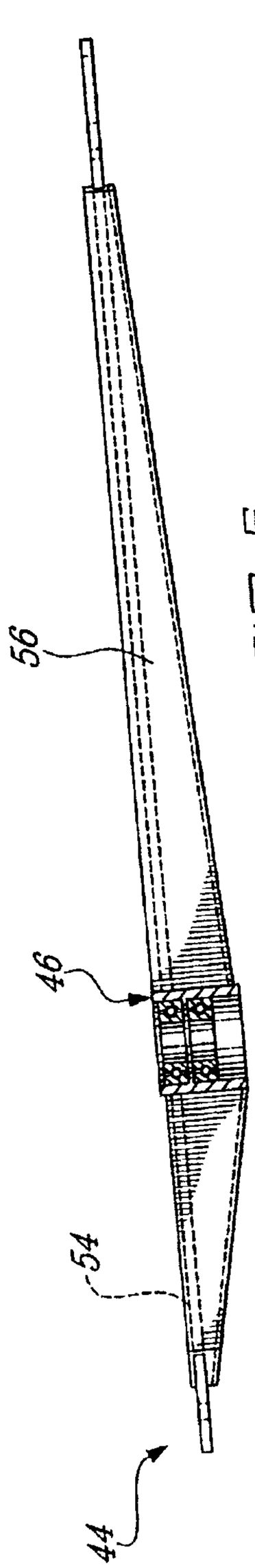
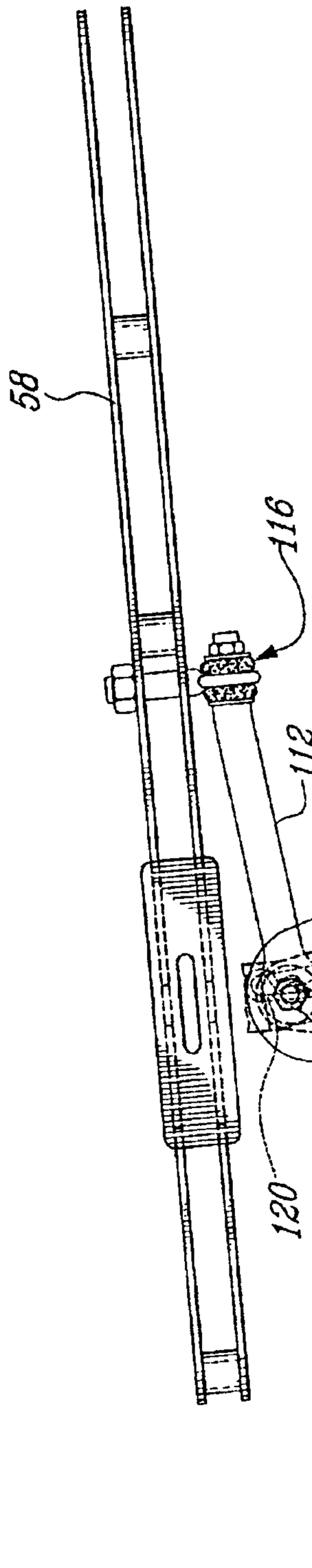


FIG. 6



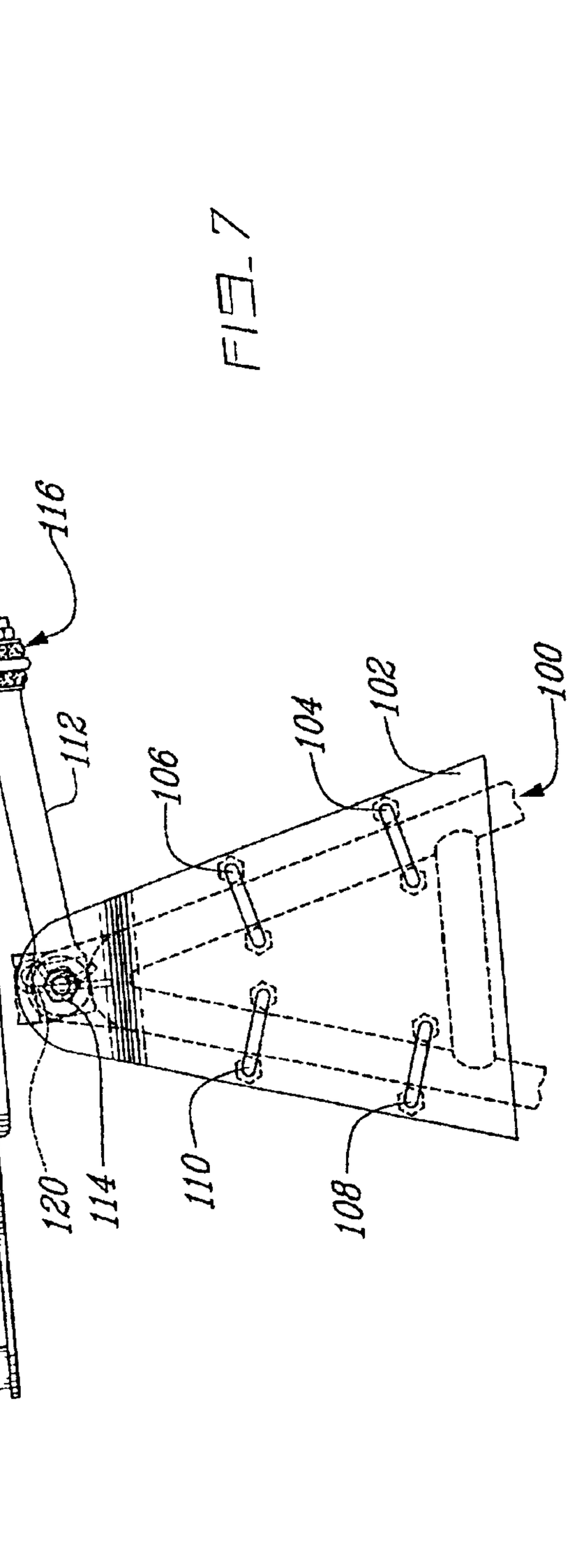


FIG. 7

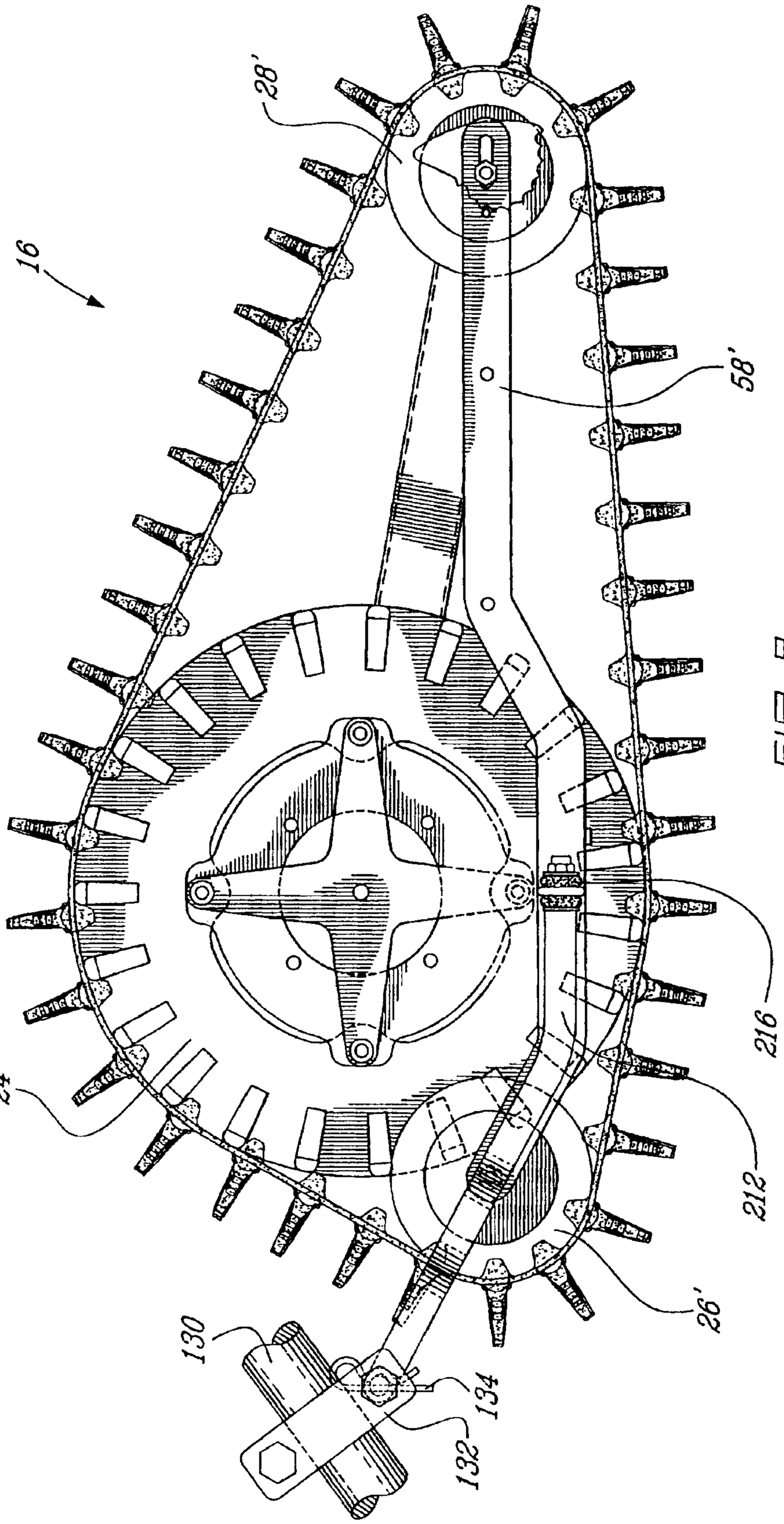


FIG. 8

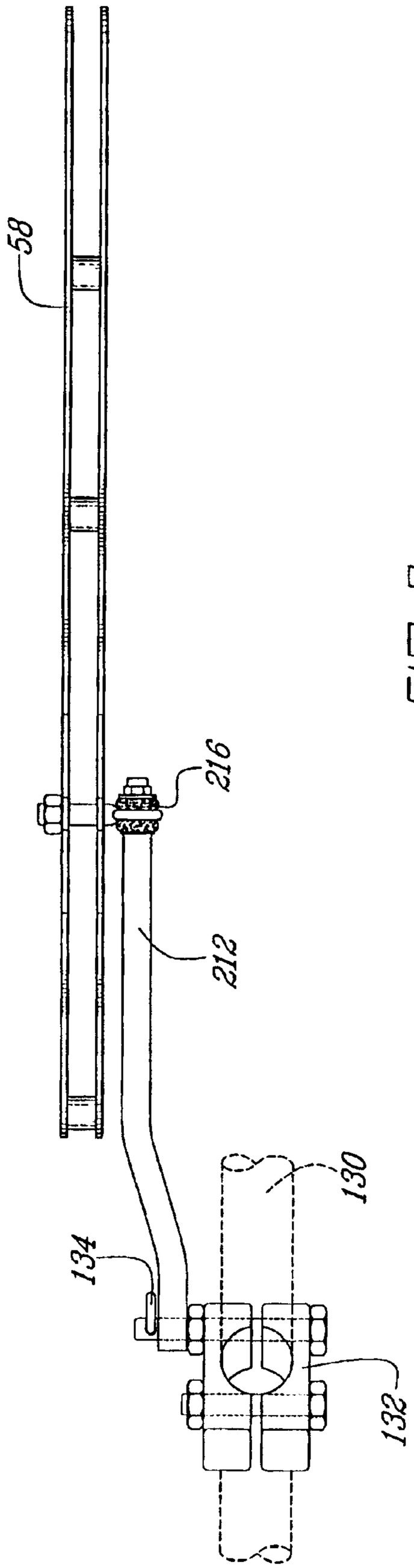


FIG. 9

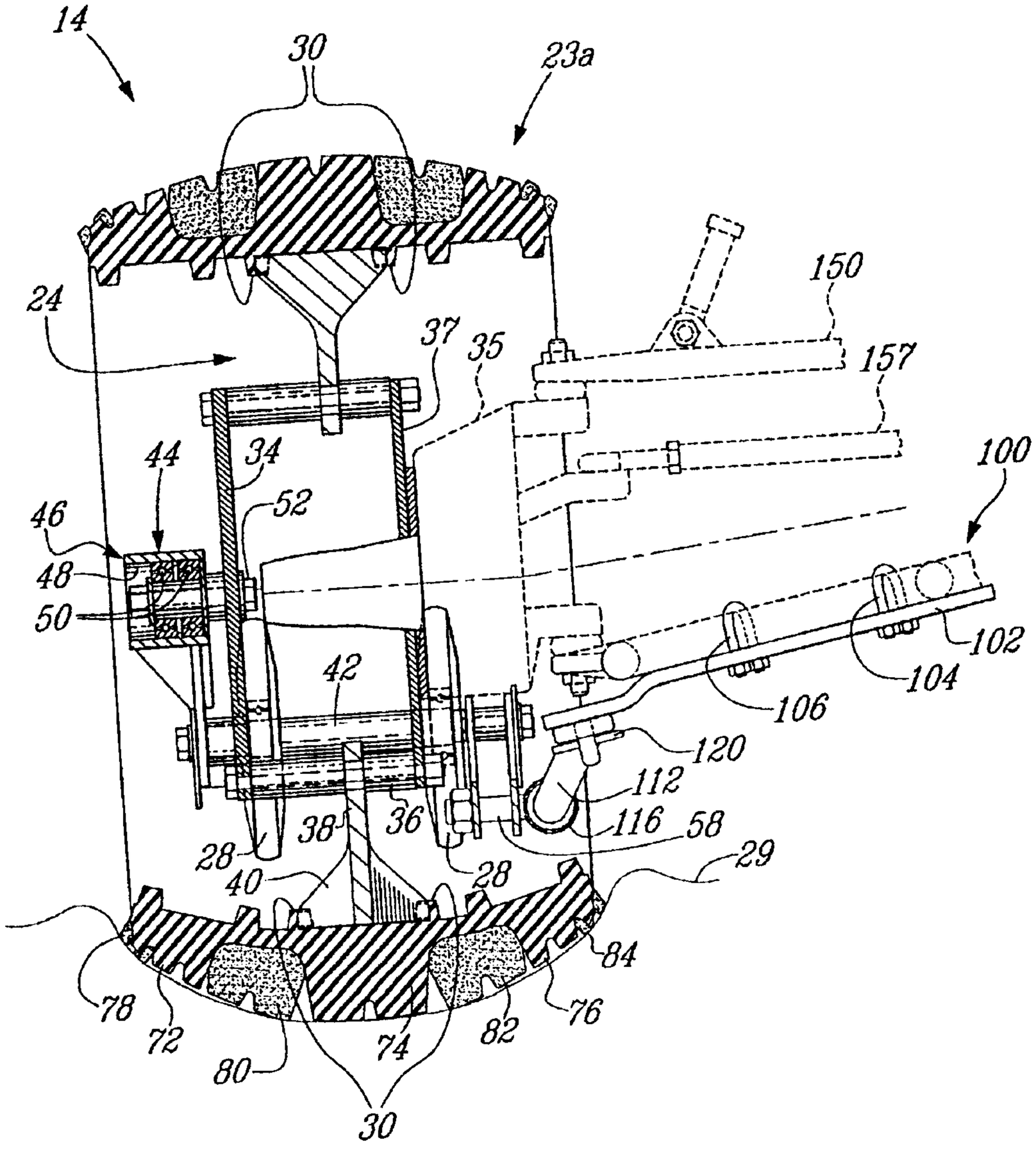

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FIG. 10

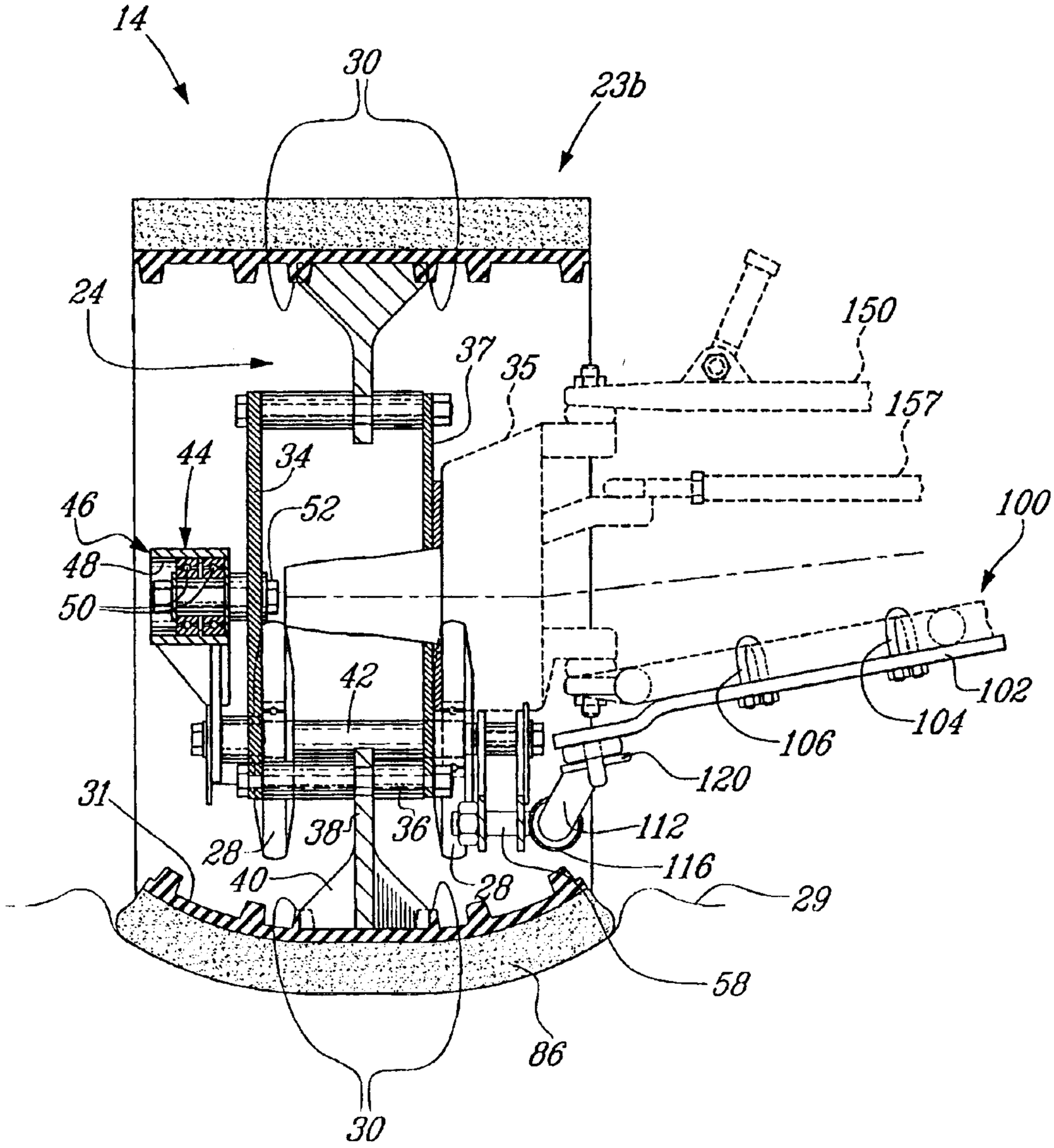
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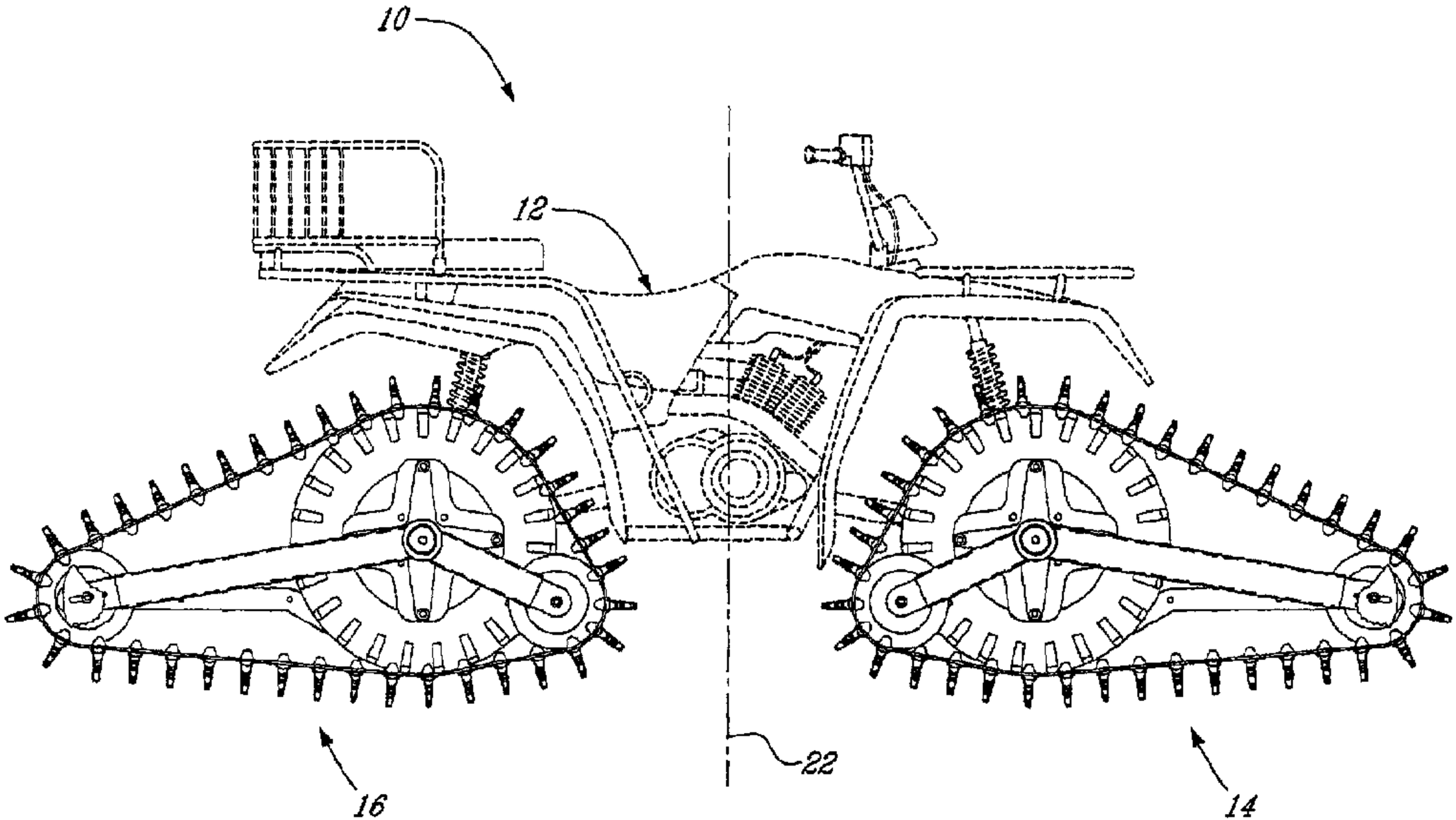
FIG. 11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