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(54) **Kompakt vontatószerkezet**

COMPACT PULLING APPARATUS

Description

The present document claims priority to the patent application filed in the United States on 15 April 2010 under the number 61/342,538.

TECHNICAL FIELD

The technical field relates to compact pulling apparatuses that are capable of moving over difficult terrain, such as terrain covered with snow, sand, mud, etc.

STATE OF THE ART

Several apparatuses have been proposed over the years with the intention of facilitating travelling in difficult terrain. Of these apparatuses, several are compact apparatuses enabling a person, such as a skier, to be pushed or pulled with the help of a track that is rotatably driven by an engine. Examples thereof can be found in documents FR-2,431,304 (Jaulmes) published on 15 February 1980 and US-4,519,470 (Allisio) published on 28 May 1985.

Numerous other examples exist. Most of these apparatuses make use of a petrol engine to drive the track rotatably. Some use an electric motor. Apparatuses of this kind may be useful as light modes of transport, in particular where it is difficult or even prohibited to travel by means of a larger vehicle. For example, in terrains where the surface is covered in snow, it may be the case that the snow is far too powdery and deep to permit the presence of a snowmobile. Another advantage of these apparatuses is that their transport in another vehicle is much simpler and easier than in the case of a larger and heavier vehicle, such as a snowmobile.

Unfortunately, none of the previously proposed apparatuses has proved to be entirely adapted to the very rigorous winter conditions that may be encountered during certain periods of the year in the places where these apparatuses are likely to be useful. For example, a very cold temperature may reduce considerably the reliability and the autonomy of an apparatus equipped with an electric motor that is powered by batteries. In the case of a petrol engine, the combination of the external cold and the heat released by the engine may cause a build-up of ice and compacted snow at sensitive points of the apparatus. Moreover, warmer temperatures are more likely to cause infiltrations of water into the apparatus resulting in failures which may prove to be difficult to repair, especially when they happen in locations that are deep in the forest or in other inaccessible locations.

The previously proposed apparatuses also do not permit an electrical generator to be transported easily to inaccessible locations.

It is therefore clear that improvements in the technical field concerned are still necessary.

SUMMARY

The invention is defined by independent claims 1 and 13. According to one aspect, a compact pulling apparatus is proposed, which is characterized in that it includes: an elongated watertight housing

extending along a longitudinal axis and defining an inner chamber, the housing including a top wall and a bottom wall; a track disposed around the housing along its longitudinal axis and enabling the apparatus to move when the track is rotatably driven around the housing; a handlebar connected to the housing and extending substantially rearward; a driving motor for the track, the motor being located within the inner chamber of the housing and including an output shaft mechanically connected to the track; and a ventilation circuit for the interior of the inner chamber of the housing, the ventilation circuit comprising an air inlet and an air outlet which communicate with the exterior of housing, the ventilation circuit allowing a temperature above freezing point to be maintained inside the inner chamber when the outside temperature is lower and allowing the interior of the inner chamber to be cooled when its temperature is above an upper threshold.

According to another aspect, a compact pulling apparatus is proposed, which is characterized in that it includes: an elongated watertight housing extending along a longitudinal axis and defining an inner chamber, the housing including a top wall and a bottom wall; a track disposed around the housing along its longitudinal axis and enabling the apparatus to move when the track is rotatably driven around the housing; a handlebar connected to the housing and extending substantially rearward; a generator located within the inner chamber of the housing and capable of producing electricity to power external equipment; and a petrol engine used to drive the track selectively in a rotatable manner and to cause the generator to rotate, the engine being located within the inner chamber of the housing.

According to another aspect, a method is proposed for manufacturing an apparatus as defined previously.

According to another aspect, the use is proposed of a compact pulling apparatus as proposed previously, characterized in that the apparatus travels over a snow-covered terrain.

According to another aspect, a method is proposed for utilizing a compact pulling apparatus of the type comprising an elongated watertight housing extending along a longitudinal axis and defining an inner chamber, inside which an engine is located, and also comprising a track disposed around the housing along its longitudinal axis and enabling the apparatus to move when the track is rotatably driven around the housing by means of the engine; the method being characterized in that it comprises the following simultaneous steps: maintaining a minimum temperature within the inner chamber using heat released by the motor; evacuating heat from the inner chamber if the temperature exceeds a threshold value; and maintaining a positive pressure inside the inner chamber.

Further details of these aspects, as well as of other aspects of the proposed concept, will become apparent in the light of the detailed description which follows and the accompanying figures.

BRIEF DESCRIPTION OF THE DRAWINGS

Figure 1 is an isometric view of an example of an apparatus implemented according to the proposed concept;

Figure 2 is a view from the side of the apparatus depicted in figure 1;

Figure 3 is a view similar to figure 1, but depicts the apparatus without its track and without the lateral walls on the sides of its housing;

Figure 4 is a view similar to figure 3, but depicts the left-hand side of the apparatus viewed from the rear;

Figure 5 is a view of the right-hand side of the apparatus depicted in figure 3;

Figure 6 is a view from above of the apparatus depicted in figure 3;

Figure 7 is a view similar to figure 1, but in which the operator is standing in a sledge hitched to the apparatus; and

Figures 8 to 13 are views similar to figures 1 to 6, but depict a second example of an apparatus in which an electric motor is used.

DETAILED DESCRIPTION

Figure 1 is an isometric view of an example of an apparatus 10 implemented according to the proposed concept. In this example, the apparatus 10 utilises a petrol engine in order to cause a track 12 disposed around an elongated watertight housing 14 to rotate. It should be noted at this point that the reference to a "watertight" housing signifies that its construction is watertight, but does not exclude the presence of a ventilation circuit for the interior of the housing 14. This ventilation circuit comprises at least one air inlet and at least one air outlet. The ventilation circuit makes it possible, in particular, to cool the interior of the housing 14 when its temperature is above an upper threshold, for example above 25 °C. Other values are also possible.

The rotation of the track 12 around the housing 14 enables the apparatus 10 to move. The housing 14 is low-slung in order to keep its centre of gravity as low as possible. The housing 14 comprises a lateral wall 16 on each side. The housing 14 may be made, for example, from a metallic material, a plastic material, or both. Aluminium is an example of one possible material for the housing 14, since this material is light and strong. The track 12 may be made from rubber or from some other polymer. Other materials are possible.

The apparatus 10 comprises a handlebar 20 which is connected to the housing 14. The handlebar 20 extends substantially towards the rear of the apparatus 10. The handlebar 20 is intended to be held and manipulated by an operator 22 who is situated at the rear of the apparatus 10, as illustrated in a semi-schematic manner in figure 1. The handlebar 20 may be pivoting or fixed, depending on the needs. When it is pivoting, it is possible to limit the pivoting of the handlebar 20 between a minimum angle and a maximum angle in relation to the horizontal.

The operator 22 may be equipped with skis 24 (or the equivalent) or, alternatively, may be on board a sledge hitched to the apparatus 10. As can be seen in figure 1, the centre of gravity of the apparatus 10 is below the height of the knees of the operator 22.

The operator 22 has controls available on the handles of the handlebar 20 enabling him, in particular, to control the travelling speed of the apparatus 10 and other functions. The controls (not illustrated) may be connected to the housing 14 by means of wires and/or wireless means of communication. Depending on the model, it is in particular possible to provide a device enabling the apparatus 10 to reverse by using the force of its own engine, which can be very useful in certain circumstances. Levers for operating a brake may also be provided (see figure 13). These levers may be positioned in a similar manner to the brake levers of a bicycle or a motor cycle, for example. Other elements may be mounted on the handlebar 20, depending on requirements, such as a lamp, indicator dials, etc.

When it is travelling forwards, the apparatus 10 pulls the operator 22 along and, if necessary, transports a payload, such as a payload placed on board a sledge hitched to the apparatus 10. Such an apparatus 10 can easily pull a load equivalent to two times its own weight in powdery snow. For example, tests carried out with the help of an apparatus weighing 125 kg (275 lb) have shown that such an apparatus was capable of pulling a load of 225 kg (550 lb) over a distance of 150 km on a single tank of petrol.

The operator 22 may modify the direction of travel of the apparatus 10 by moving the handlebar 20 sideways in the direction opposite the turn to be made. This action is similar to the one performed by the operator of a small conventional lawn mower.

Figure 2 is a side view of the apparatus 10 depicted in figure 1. Figures 1 and 2 depict the assembled apparatus 10. Figure 3 is a view similar to figure 1, but depicts the apparatus 10 without its track 12 and without the lateral walls 16 on the sides of its housing 14. Figure 4 is a view similar to figure 3, but depicts the left-hand side of the apparatus 10 viewed from the rear. Figure 5 is a view of the right-hand side of the apparatus 10 depicted in figure 3.

As can be seen in figures 3 and 4 in particular, the housing 14 forms an inner chamber 30, positioned inside which are different component parts of the apparatus 10, such as its petrol engine 32. The housing 14 also possesses a top wall 14a, a bottom wall 14b, a front wall 14c and a rear wall 14d. The housing 14 possesses a reinforcing structure, which may include one or a plurality of internal walls that are capable of compartmentalizing the inner chamber 30. The compartments communicate with each other.

A pair of top skids 34 is disposed longitudinally on the top wall 14a of the housing 14. A pair of bottom skids, similar to that on the top wall 14a, is disposed longitudinally on the bottom wall 14b of the housing 14. The skids are made from a material having a very low coefficient of friction. In particular, they permit the track 12 to rotate about the housing 14 and make it possible to reduce the friction between the interior face of the track 12 and the exterior of the housing 14. They also serve as guides for maintaining the track 12 in the axis of the apparatus 10. The skids extend for a few centimetres beyond the front and rear ends of the upper 14a and lower 14b walls in order to support the track 12 for almost the entire length of the apparatus 10.

At least one front roller is rotatably mounted at the front of the housing 14. Two front rollers 40 are provided in the illustrated example. The front rollers 40 are mounted coaxially around a front transverse

axle 42, which is supported by an internally greased axle secured at its ends to two opposing plates 44 disposed parallel to the longitudinal axis of the apparatus 10. The plates 44 are connected in a rigid manner at the front of the housing 14. Also in the illustrated example, a bumper 46 is provided at the extreme front of the apparatus 10. The ends of the bumper 46 are connected to the two plates 44, as illustrated in particular in figures 3 and 4. A sufficient clearance is provided between the interior of the bumper 46 and the front rollers 40 in order to permit the track 12 to rotate around the housing 14 without interfering with the interior of the bumper 46.

At least one rear roller is rotatably mounted at the rear of the housing 14. Two rear rollers 50 are provided in the illustrated example. The rear rollers 50 are mounted coaxially about a rear transverse axle 52, which is supported at its ends by roller bearings situated in two opposing plates 54 disposed parallel to the longitudinal axis of the apparatus 10. The plates 54 are connected in a rigid manner to the rear of the housing 14. Also in the illustrated example, a mechanical link is provided between the output shaft of a transmission 60 situated in the housing 14 and the rear transverse axle 52. The rear rollers 50 are thus utilized to drive the track 12 causing it to rotate in order to be able to move the apparatus 10. Different types of mechanical links may be used between the transmission 60 and the rear transverse axle 52. The one which is illustrated here comprises a belt 62 or a chain and permits a reduction in the speed of rotation between the output shaft of the transmission 60 and the rear transverse axle 52. Other types of links and configurations are also possible. The mechanical link between the motor 32 and the transmission 60 is assured by a belt 64. The transmission 60 may permit forward and reverse travel, for example. It may have one or even several speeds, or it may be of variable speed configuration.

The rear transverse axle 52 also supports a brake disc 66, which is depicted in figure 4. The disc is situated close to the left-hand end in the example. The brake shoes are connected to the housing 14 and may be actuated by the operator 22 from the handlebar 20 (see figure 13).

The driving engine 32 for the track 12 in the example depicted in figures 1 to 4 is a petrol engine situated directly at the front of the transmission 60. An intermediate transverse wall is present in the illustrated example in order to reinforce the part between the petrol engine 32 and the transmission 60. The petrol engine 32 is supplied with fuel from a tank 70 situated at the front of the inner chamber 30 of the apparatus 10. A battery 72 is positioned to one side of the petrol tank. This battery 72 serves in particular to supply the electric starter of the petrol engine 32. The operator 22 is thus able to start and stop the engine 32 without the need to be able to access it directly.

The apparatus 10 in figures 1 to 5 also incorporates a generator 80 located within the inner chamber 30 and having the ability to produce the electricity intended to supply one or more pieces of external equipment at a voltage corresponding in particular to a domestic socket outlet, such as 110 V or 220 V/240 V at 60 Hz or alternatively at 50 Hz. One or more sockets are available on the apparatus 10 or alternatively on the generator 80 itself. The generator 80 comprises an internal rotor capable of being driven causing it to rotate by means of the same petrol engine 32. The possibility of generating electricity from the apparatus 10 may be of considerable benefit to users such as workmen who are

required to use electrical tools on isolated sites, or alternatively to the owners of cabins located remotely from populated areas. A very large number of other applications may be envisaged. A generator with a power output of 4000 to 6000 W may be installed in an apparatus 10 of the size illustrated here. A smaller generator, or even a larger generator, is also possible.

The axis of the generator 80 is disposed transversely to the longitudinal axis of the apparatus 10. The generator 80 could also be positioned differently in certain models. It is connected to the output shaft of the petrol engine 32 via a transmission belt 82. An electric clutch 84 mounted on the shaft of the generator 80 permits the mechanical link between the generator and the petrol engine 32 to be activated and deactivated remotely. As a result, unnecessary rotation of the rotor of the generator 80 can be avoided when there is no need for the generator 80 to be used, such as when the apparatus 10 is in motion. When the generator 80 is in operation, the transmission 60 of the apparatus 10 is set to neutral.

The admission of fresh air into the inner chamber 30 of the housing 14 takes place via a series of apertures 90 provided on at least one side of the housing 14, immediately below the top wall 14a. The apertures 90 have a relatively small diameter in order to permit a reduction in the ingestion of snow and debris, such as twigs or other items. The air which passes through the apertures 90 enters an intake box 92, which collects the air arriving from all the apertures 90 on either side of the housing 14. In the course of using the apparatus 10, the intake box 92 is heated from below thanks to the heat which is released by the petrol engine 32 and which circulates inside the inner chamber 30. This heat allows the inner chamber 30 to be kept well above freezing point (0 °C) even if the outside temperature is very cold, for example below -20 °C. Thanks to this heat, any particle of snow which enters into the inlet box 92 is able to melt and drain away towards the outside, and to do this even during cold weather. The air exits from the inlet box 92 via an outlet pipe 94, which is circular in the example. The top of the outlet pipe 94 may be raised by several millimetres in relation to the bottom of the inlet box 92 in order to prevent the water from flowing directly towards the inner chamber 30.

Figure 6 is a view from above of the apparatus 10 depicted in figure 3. The air inlet box 92 can be seen here. The air which exits from the inlet box 92 is then channelled into a flexible duct 95 (illustrated in a schematic manner in figure 4) leading to the inlet 33 of the volute of the cooling fan integrated into the petrol engine 32. The fan in the engine 32 thus generates the suction force required in order to draw the air through the apertures 90. The cooling air passes around the one or more cylinders of the petrol engine 32 and then ends up inside the inner chamber 30.

The extraction of the air from the interior of the apparatus 10 takes place in two ways. On the one hand, the combustion of the petrol in the engine 32 generates exhaust gases. The air used in this combustion process is admitted into the interior of the engine 32 from the interior of the inner chamber 30, or it may also arrive directly from the inlet box 92 in the case of certain engines. The exhaust gases as they emerge from the one or more cylinders of the engine 32 are then directed towards the rear of the apparatus 10 through an exhaust pipe 96, which is depicted in figure 6. The outlet from the exhaust pipe 96 is situated in the space 98, where the rear transverse axle 52 and the two rear rollers 50 are located.

This space 98 is partially obstructed by the presence of the track 12 when the apparatus 10 is assembled. This configuration makes it possible in particular to reduce the noise and to avoid all possible contact between the skin or the clothing of the operator 22 and the hot outlet from the exhaust pipe 96. Other configurations are also possible.

Some air is also evacuated from the interior of the inner chamber 30 via an air outlet which is part of the ventilation circuit. The air passing through the outlet first travels through the cooling circuit of the generator 80 and then circulates through a flexible duct 104 (represented in a schematic manner in figure 4) as far as the entrance to an air outlet box 100. The outlet box 100 has a construction similar to that of the inlet box 92. The air is then evacuated through apertures 102 located on at least one side of the housing 14.

When the generator 80 is in operation, the fan which is integrated into the generator 80 contributes to the movement of the air in order to increase the flow of air for its cooling. Additional fans disposed in series on the flexible ducts connected to the air inlet and to the air outlet can permit the circulation of air to be further increased if the temperature inside the inner chamber 30 becomes too high. These fans may be brought into action automatically thanks to a thermostat equipped with a temperature sensor or some other device.

The apparatus 10 is configured in such a way that a positive pressure is created inside the inner chamber 30. This is implemented by providing a total air inlet surface area that is greater than the total outlet surface area. In the example, the number of apertures 90 is greater than the number of apertures 102. The positive pressure makes it possible, in particular, to achieve better water tightness of the housing 14.

When the apparatus 10 is in motion, the sides of the housing 14 are closed in a watertight manner by means of the side walls 16, as shown in figures and 2. These side walls 16 are screwed or otherwise attached to the rest of the housing 14. The interior of the housing 14 thus remains watertight and dry while the apparatus 10 is in operation.

As depicted in figure 5, the underside of the housing 14 is convex at its centre. This variation in level is in the order of 3 cm at the front and at the rear of the track 12 in the apparatus 10 that is illustrated by way of example. This central part corresponds approximately to one third of the length of the apparatus 10. The variation in level facilitates in particular the yawing motion in bends as well as the manual pivoting of the apparatus 10 on hard and rough surfaces, such as asphalt and concrete. Moreover, the front of the bottom wall 14b defines an angle in relation to the horizontal. The front transverse axle 42 is thus higher than the rear transverse axle 52. This also makes it easier to negotiate obstacles.

Figure 7 is a view similar to figure 1, but in which the operator 22 is standing in a sledge 200 hitched to the apparatus 10. The hitch 202 of the sledge 200 is connected to a support 210 having the form, in the illustrated example, of a transverse strut that is straight or alternatively slightly curved towards the rear at its centre. The transverse strut 210 is supported by two corresponding plates 212 projecting towards the top of the housing 14. The hitch 202 comprises two retaining arms for the sledge 200, which are

attached to a plate 204 with the ability to pivot about a vertical axis at its junction with a hitch element 206. The hitch element 206 is able to slide from left to right along the transverse strut 210 thanks to pulleys positioned to either side of the hitch element 206. In a turn, the hitch element 206 is then able to move towards one of the ends of the transverse strut 210, thereby facilitating the manoeuvrability of the apparatus 10 and reducing the effort required on the part of the operator 22.

Figures 8 to 13 are similar views to those in figures 1 to 6, but depict a second example of an apparatus 300 in which an electric motor is utilized. This apparatus 300 is otherwise similar to the apparatus 10 depicted in the preceding example. The apparatus 300 comprises, among other things, a track 302, a watertight housing 304 and a handlebar 306, which is held by an operator 308. The apparatus 300 may also be used with the sledge 200 depicted in figure 7.

The track 302 of the apparatus 300 is rotatably driven with the help of an electric motor 310 (figure 10). This motor 310 is supplied with electricity by one or a plurality of batteries 312, also positioned inside the inner chamber 314 of the housing 304. The electric motor 310 may be of the AC or DC type, with or without permanent magnets. A group of four deep-cycle lead batteries 312 is shown in the illustrated example. The number and the type of batteries 312 may differ according to requirements. The batteries 312 are connected to an electric controller that is actuated by the operator 308 from the handles of the handlebar 306. The different electrical connections are not shown in the figures in order to simplify the illustrations.

During use, the electric motor 310 gives off heat. This heat represents about 10% of the electrical energy drawn from the batteries 312. The heat thus dissipated is utilized inside the inner chamber 314 of the apparatus 300 in order to keep the batteries 312 warm when the outside temperature is very cold. This heat then permits an optimal temperature to be maintained for the batteries in spite of the very cold weather. The optimal temperature may be in the order of 20 to 25 °C, for example. Other temperatures are also possible. The recovery of this heat is beneficial because most batteries lose their efficiency in cold weather. This is particularly true in the case of lead batteries. Although more efficient types of battery exist, lead batteries remain an interesting choice because they are readily available and relatively inexpensive. They are more resistant to the cold than nickel or lithium batteries, for example. However, the efficiency of lead batteries decreases in an almost linear fashion depending on the temperature, for example ranging from 100 % at 25 °C to 30 % at -40 °C, according to the exact type of battery. The fall in efficiency thus has a direct influence on the autonomy of the apparatus 300. By keeping the heat inside the housing 304 during cold weather, the batteries 312 are then able to maintain an efficiency that is significantly better than that which they would have at low temperature. The interior of the housing 304 may also be insulated to help to conserve heat.

An internal ventilation system is provided in case of overheating, for example when the apparatus 300 is operating in mild weather and when the electric motor 310 is under heavy load. This internal ventilation system is part of the ventilation circuit. It may include a thermostat, which actuates at least one fan providing a supply of air from the outside in order to dissipate the internal heat. The air inlet and the air

outlet may be located in the top of the handlebar 306 at a certain distance one from the other. The air then circulates inside the tubes forming the sides of the handlebar 306. The one or more fans may be located inside the housing 304 or alternatively inside the handlebar 306. The junction between the handlebar 306 and the housing 304 is configured in such a way as to permit a passageway for the air between them. The housing 304 may thus be constructed in a very watertight manner up to the height of the air inlet and the air outlet in the handlebar 306. A positive pressure is maintained inside the inner chamber 314 in order to reduce the risks of water infiltration at locations which may not be tightly sealed. The apparatus 300 can then even be immersed in water from time to time, which may be required, for example, when the apparatus 300 needs to cross an unfrozen stream or a similar area of water.

It is possible to incorporate a heating element, such as a heating cable, in the interior of the housing 304 in order to keep the batteries 312 warm when they are being charged outdoors during cold weather and also while they are being stored outdoors.

It is also possible to provide a fixed support located above the track 302. This support may be installed on one or other of the examples of apparatuses 10, 300 presented here. The support may be useful for transporting equipment, such as a tool box.

REFERENCE NUMBERS

10	apparatus
12	track
14	housing
14a	top wall
14b	bottom wall
14c	front wall
14d	rear wall
16	side walls
20	handlebar
22	operator
24	skis
30	inner chamber
32	petrol engine
33	air inlet
34	top skids
40	front rollers
42	front transverse axle
44	plates
46	bumper

50 rear rollers
52 rear transverse axle
54 plates
60 transmission
62 belt
64 belt
66 brake disc
70 tank
72 battery
80 generator
82 transmission belt
84 electric clutch
90 apertures
92 inlet box
94 outlet pipe
95 flexible duct
96 exhaust pipe
98 space
100 outlet box
102 apertures
104 flexible duct
200 sledge
202 hitch
204 plate
206 hitch element
210 support (transverse strut)
212 plates
300 apparatus
302 track
304 housing
306 handlebar
308 operator
310 electric motor
312 batteries
314 inner chamber

KOMPAKT VONTATÓSZERKEZET

Szabadalmi igénypontok

1. Kompakt vontatószerkezet (10, 300), amely magában foglal:

- egy hosszúkás alakú tömített házat (14, 304), amely egy hossztengely mentén terjed ki és egy belső kamrát (30, 314) határoz meg, ahol a háznak (14, 304) egy felső fala (14a) és egy alsó fala (14b) van;

- egy hernyótalpat (12, 302), amely a ház (14, 304) körül annak hossztengelye mentén van elrendezve és lehetővé teszi a szerkezet (10, 300) számára, hogy mozogni tudjon, ha a hernyótalp (12, 302) meg van hajtva a ház (14, 304) körül forgatva;

- egy kormányrudat, illetve kormányrudazatot, amely össze van kötve a házzal és lényegében hátrafelé terjed ki;

- egy hajtómotort (32, 310) a hernyótalphoz (12, 302), ahol a motor (32, 310) a ház (14) belső kamrájában (30, 314) van elrendezve és egy kimenőtengelyt tartalmaz, amely mechanikusan össze van kötve a hernyótalppal (12, 302); és

- egy szellőztetőkört a ház (14, 304) belső kamrája (30, 314) számára, ahol a szellőztetőkör egy levegőbemenetet (90) és egy levegőkimenetet (102) foglal magában, amelyek a ház külső oldalával (14, 304) állnak összeköttetésben,

azzal jellemezve, hogy

a szellőztetőkör egy termosztátot és legalább egy ventilátort tartalmaz, ami lehetővé teszi a belső kamra (30, 314) belsejében egy fagypont fölötti hőmérséklet megtartását, ha a külső hőmérséklet annál alacsonyabb, és lehetővé teszi a belső kamra (30, 314) belsejének lehűtését, ha annak hőmérséklete túllépett egy felső határértéket.

2. Az 1. igénypont szerinti szerkezet (10), **azzal jellemezve**, hogy a motor egy benzinmotor (32), amely egy tartályból (70) van üzemanyaggal táplálva, amely a ház (14) belső kamrájában (30) található, emellett a szerkezet (10) előnyösen egy generátort (80) is tartalmaz, amely a belső kamrában (30) van elrendezve és arra szolgál, hogy villanyáramot termeljen egy külső felszerelés ellátására.

3. A 2. igénypont szerinti szerkezet (10), **azzal jellemezve**, hogy a szellőztetőkör levegőbemenete egy levegőbemeneti dobozt (92) tartalmaz, amely a belső kamrában (30) felül van elrendezve és lehetővé teszi a hő belső kamrába (30) való behatolásának mérséklését, ahol a levegőbemeneti doboz (92) előnyösen nyílásokkal (90) van ellátva, amelyek a ház (14) legalább egyik oldalán, előnyösen a ház (14) mindkét oldalán vannak elrendezve, ahol mindegyik nyílás (90) össze lehet kötve a levegőbemeneti doboz (92) egy levegőkimenetével.

4. A 2. vagy 3. igénypont szerinti szerkezet (10), **azzal jellemezve**, hogy a szerkezet egy kipufogócsövet (96) tartalmaz, ahol a kipufogócsőnek (96) egy első, a motorral (32) összekötött

vége és egy második, a belső kamrán (30) kívülre kitorkolló vége van, ahol a kipufogócső (96) második vége előnyösen a szerkezet (10) hátoldalán torkollik ki, a ház (14) és a hernyótalp (12) belső oldala között.

5. Az 1. igénypont szerinti szerkezet (300), **azzal jellemezve**, hogy a motor egy villanymotor (310), amely legalább egy, a ház (304) belső kamrájában (314) elrendezett akkumulátorról (312) van táplálva, ahol a villanymotor (310) előnyösen több ólomakkumulátorról (312) van táplálva és/vagy a szellőztetőkör előnyösen a villanymotor (310) által leadott hőt használja fel hőforrásként, főként a belső kamrában (314) uralkodó hőmérséklet körülbelül 20-25 °C-on való megtartására, így biztosított az akkumulátorok (312) optimális hatékonysága.

6. Az 1. igénypont szerinti szerkezet (300), **azzal jellemezve**, hogy magában foglal:

- egy a ház (14) belső kamrájában (30) elrendezett generátort (80), amely arra szolgál, hogy villanyáramot termeljen egy külső felszerelés táplálására.

7. Az 1. vagy 6. igénypont szerinti szerkezet (10, 300), **azzal jellemezve**, hogy magában foglal:

- egy pár felső csúszótalpat (34), amelyek a ház (14, 304) felső falán (14a) hosszirányban vannak elrendezve;

- egy pár alsó csúszótalpat, amelyek a ház (14, 304) alsó falán (14b) hosszirányban vannak elrendezve;

- legalább egy elülső görgőt (42), amely a ház (14, 304) elülső oldalán van forgathatóan felerősítve; és

- legalább egy hátsó görgőt (50), amely a ház (14, 304) hátsó oldalán van forgathatóan felerősítve, emellett

- a hernyótalp (12, 302) egy olyan belső oldallal rendelkezik, amelyet a csúszótalpak (34) és a görgők (42, 50) hordoznak.

8. A 7. igénypont szerinti szerkezet (10, 300), **azzal jellemezve**, hogy egy közlőművet (60) tartalmaz, amely a motor (32, 310) és a hernyótalp (12, 302) közötti mechanikus összeköttetés legalább egy részét biztosítja, ahol a közlőmű (60) előnyösen mechanikusan van a hátsó görgővel (50) összekötve.

9. A 6. igénypont szerinti szerkezet (10), **azzal jellemezve**, hogy a generátor olyan feszültséggel termel villanyáramot, amely megfelel egy háztartási konnektor feszültségének, és/vagy **azzal jellemezve**, hogy a generátor (80) egy a ház (14) hossztengelyére keresztirányban elrendezett forgástengellyel rendelkezik, ahol a generátor (80) és a benzinmotor (32) előnyösen mechanikusan van összekötve egymással egy elektromos tengelykapcsoló (84) által.

10. Az 1-9. igénypontok bármelyike szerinti szerkezet (10, 300), **azzal jellemezve**, hogy a belső kamra (30, 314) egy az atmoszferikus nyomáshoz képest pozitív nyomáson van tartva.

11. Az 1-10. igénypontok bármelyike szerinti szerkezet (10, 300), **azzal jellemezve**, hogy a szerkezet (10, 300) egy a kormányrúdról, illetve kormányrudazatról (20) kezelhető féket (66) tartalmaz.

12. Az 1-11. igénypontok bármelyike szerinti szerkezet (10, 300), **azzal jellemezve**, hogy egy a belső kamrában (30, 314) elrendezett fűtőelemet tartalmaz, amely kívülről villanyárammal táplálható, hogy egy minimális hőmérséklet fenntartható legyen, ha a szerkezet (10, 300) nincs használatban.

13. Eljárás egy motorizált vontatószerkezet (10, 300) használatára, amely szerkezet egy hossztengely mentén kiterjedő, hosszúkás alakú tömített házzal (14, 304) rendelkezik, amely egy belső kamrát (30, 314) határol, amelyben egy motor (32, 310) van elhelyezve, és ugyancsak rendelkezik egy a ház (14, 304) körül a hossztengelye mentén elrendezett hernyótalppal (12, 302), amely a szerkezet (10, 300) számára lehetővé teszi, hogy mozogjon, amikor egy hajtással a motor (32, 310) segítségével a hernyótalpat (12, 302) forgásba hozzuk a ház (14, 304) körül, amely eljárásra **az jellemző**, hogy a következő egyidejű műveleti lépéseket tartalmazza:

- fenntartunk egy minimális hőmérsékletet a belső kamrában (30, 314) a motor (32, 310) által leadott hő révén;

- elvezetjük a belső kamrában (30, 314) levő hőt, ha a hőmérséklet túllép egy határértéket; és

- fenntartunk egy pozitív nyomást a belső kamrában (30, 314).

14. A 13. igénypont szerinti eljárás, **azzal jellemezve**, hogy az eljárás során

a szerkezetet (10, 300) egy behavazott terepen mozgatjuk, ahol vagy a benzinmotort (32) tápláljuk legalább egy, a belső kamrában (30) elrendezett benzintartályból (70), vagy a villanymotort (310) tápláljuk legalább egy, a belső kamrában (314) elrendezett akkumulátorról (312).

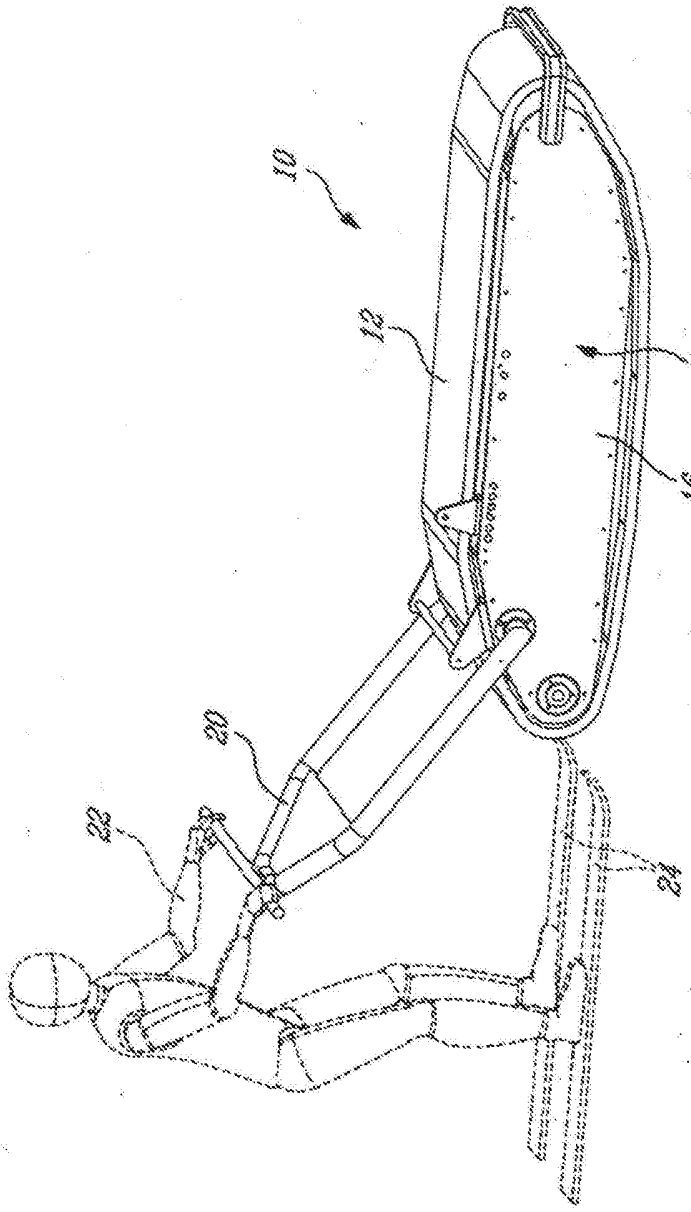

Fig-1

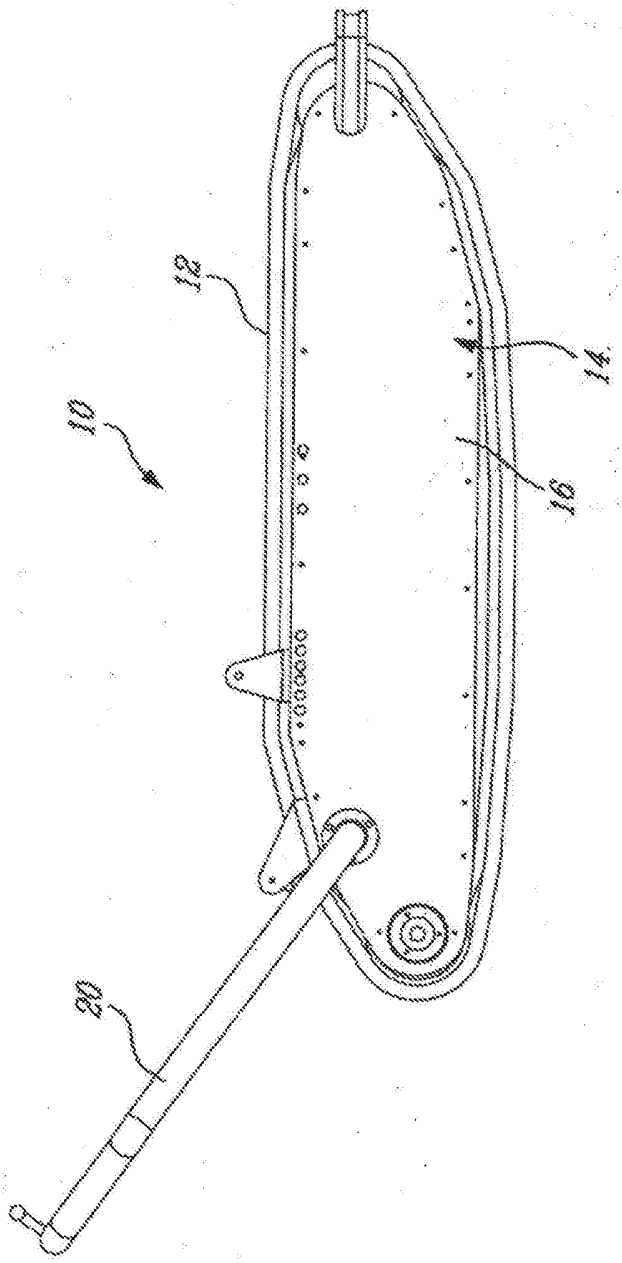

Fig. 2

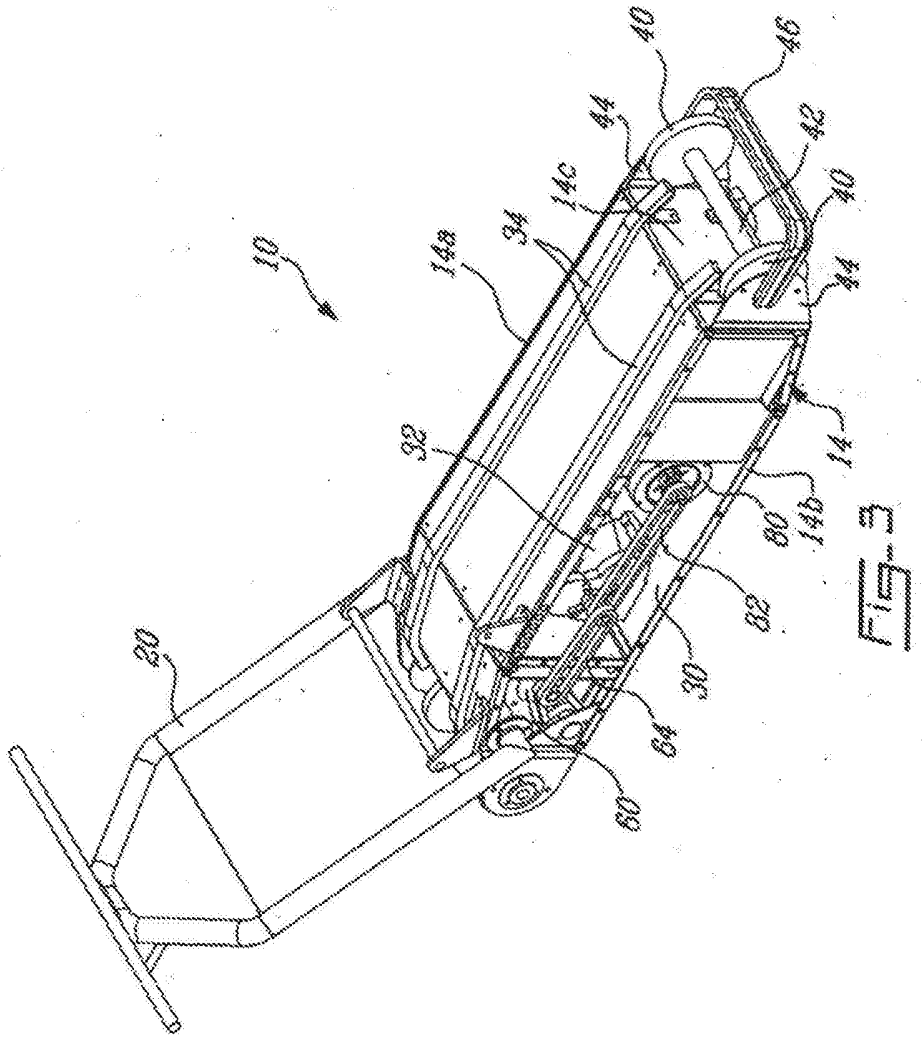

FIG. 3

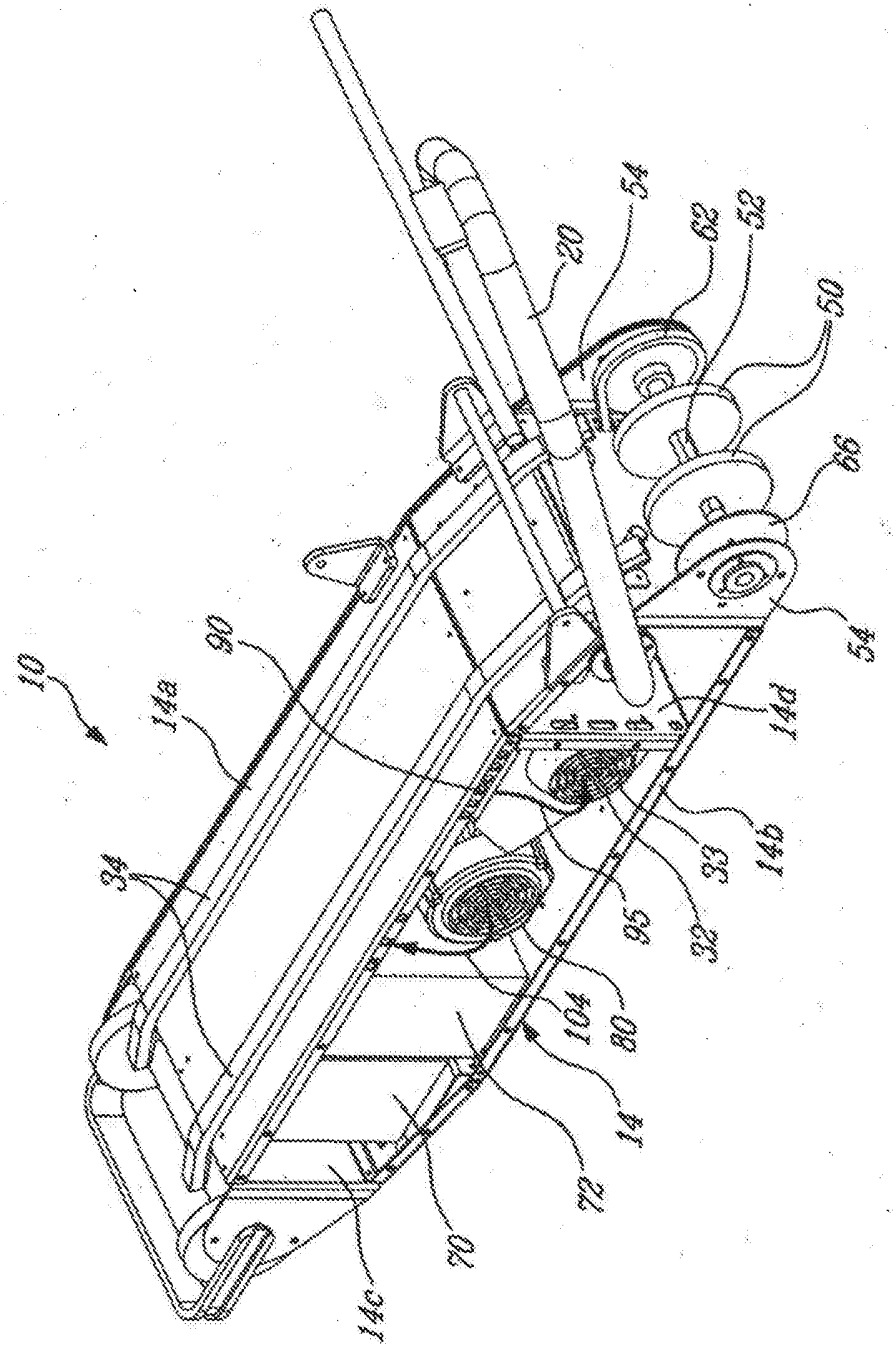

FIG-4

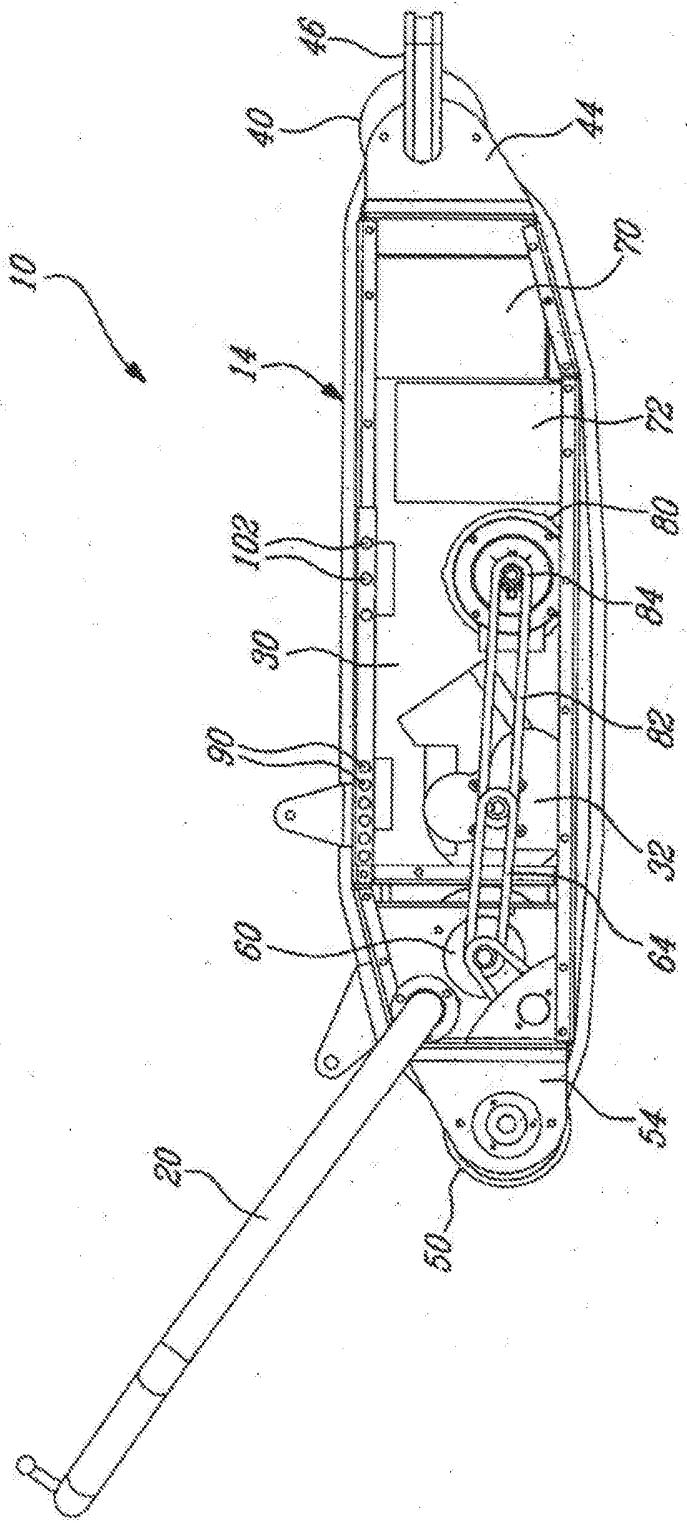

Fig. 5

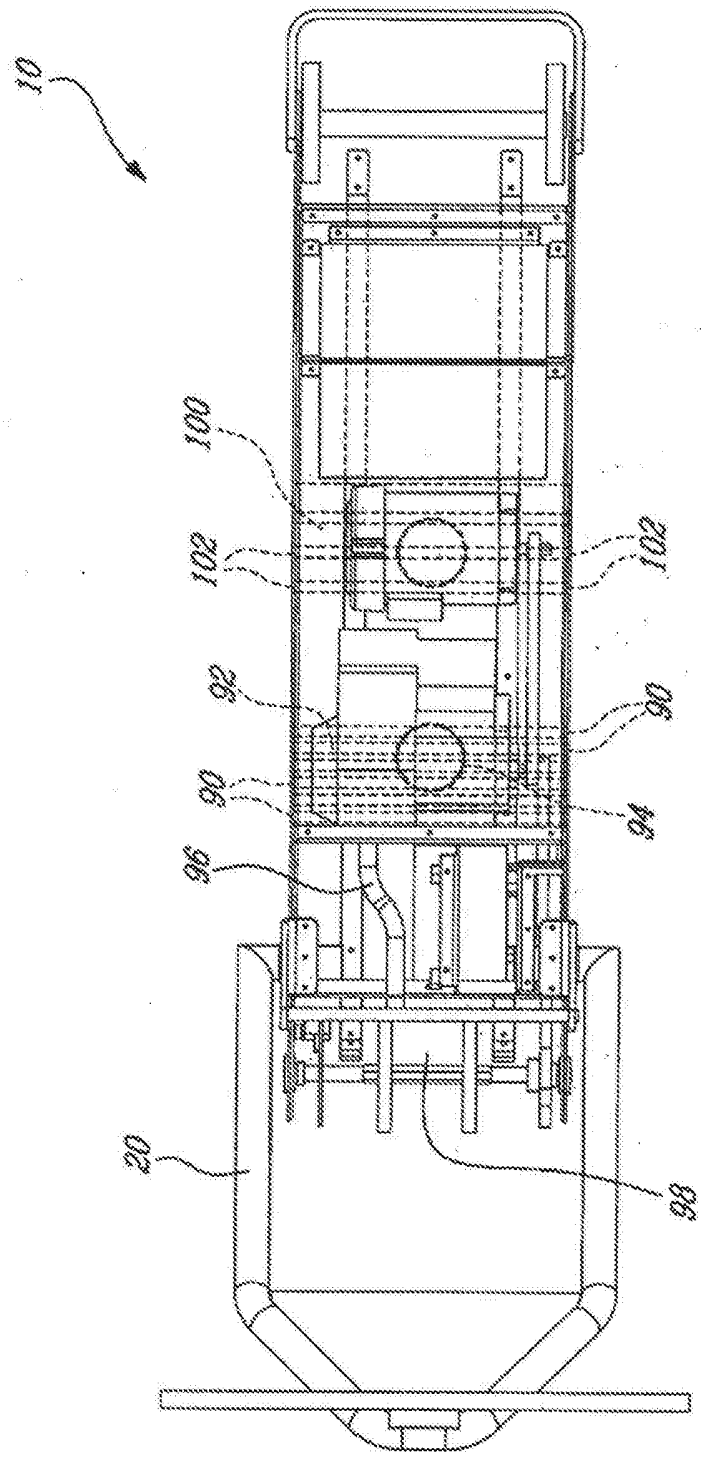

Fig. 6

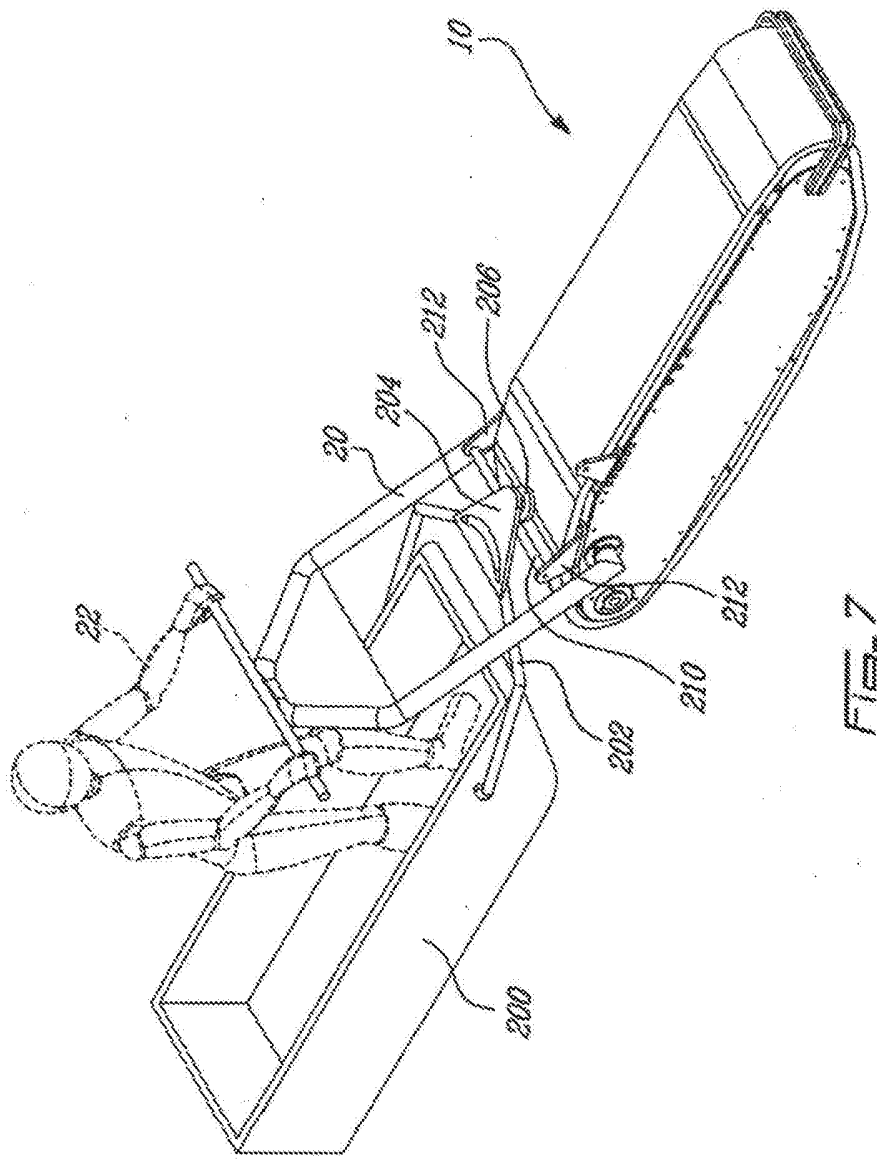

FIG. 7

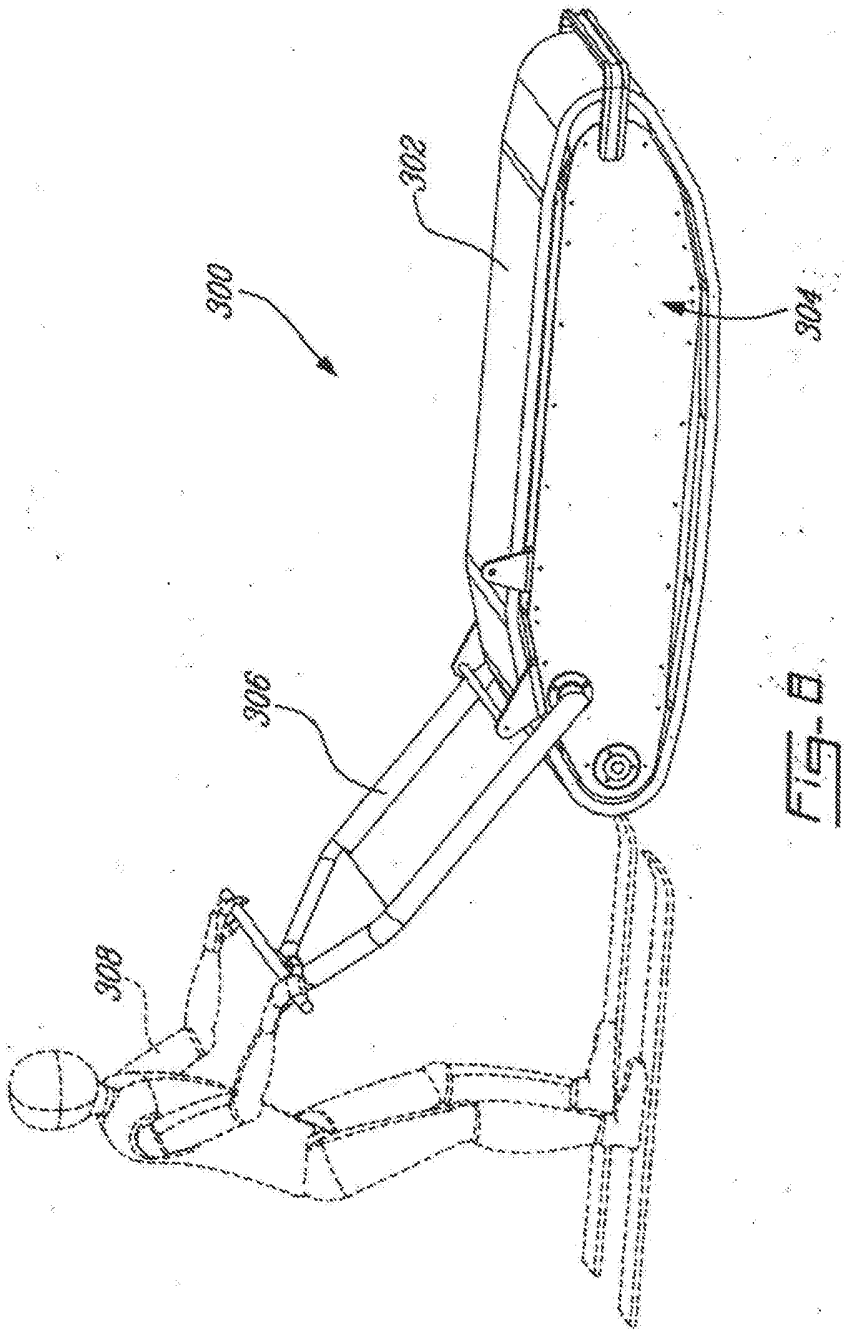

Fig. 8

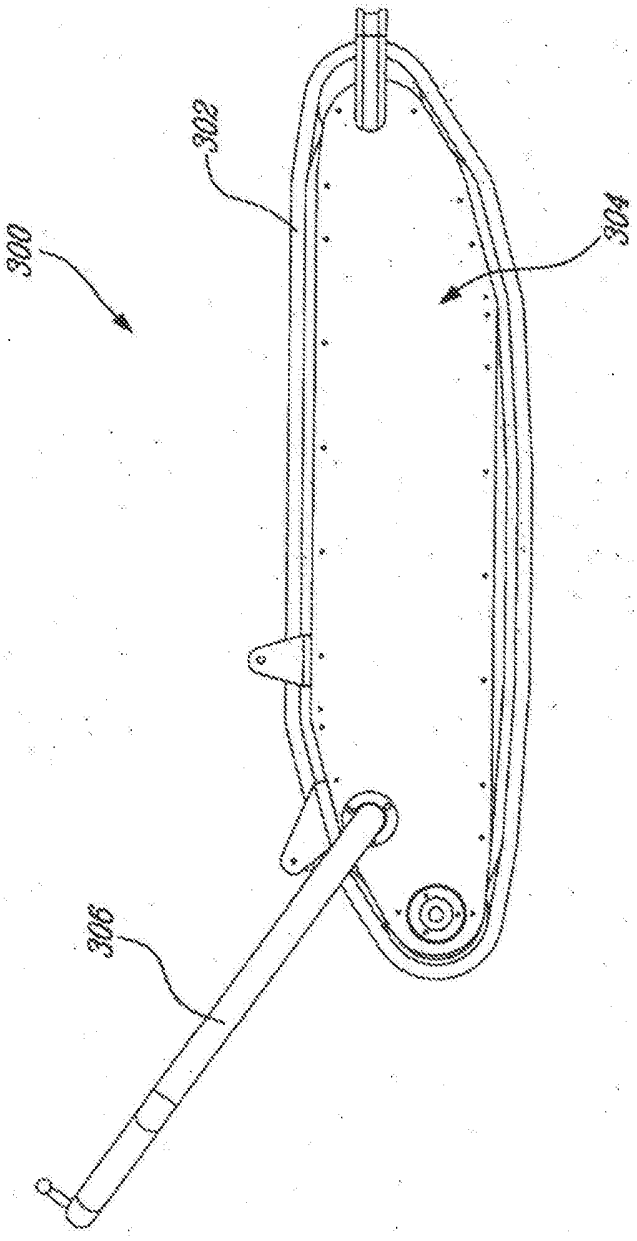

Fig. 9

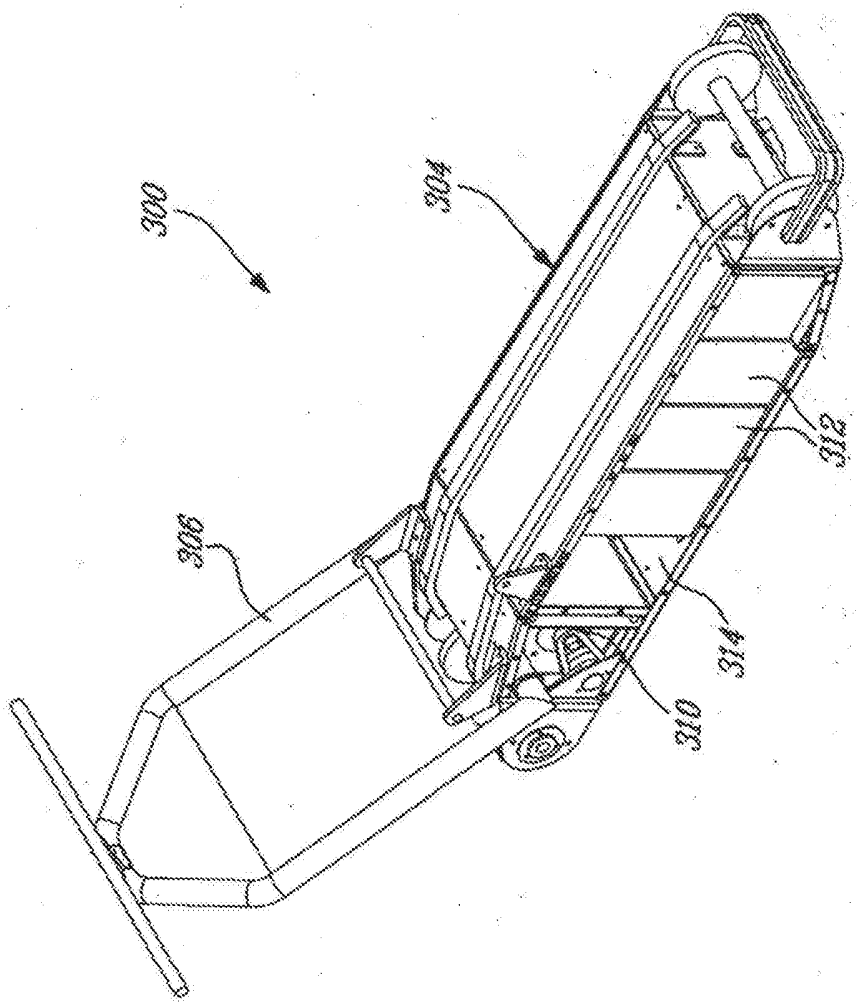

Fig. 10

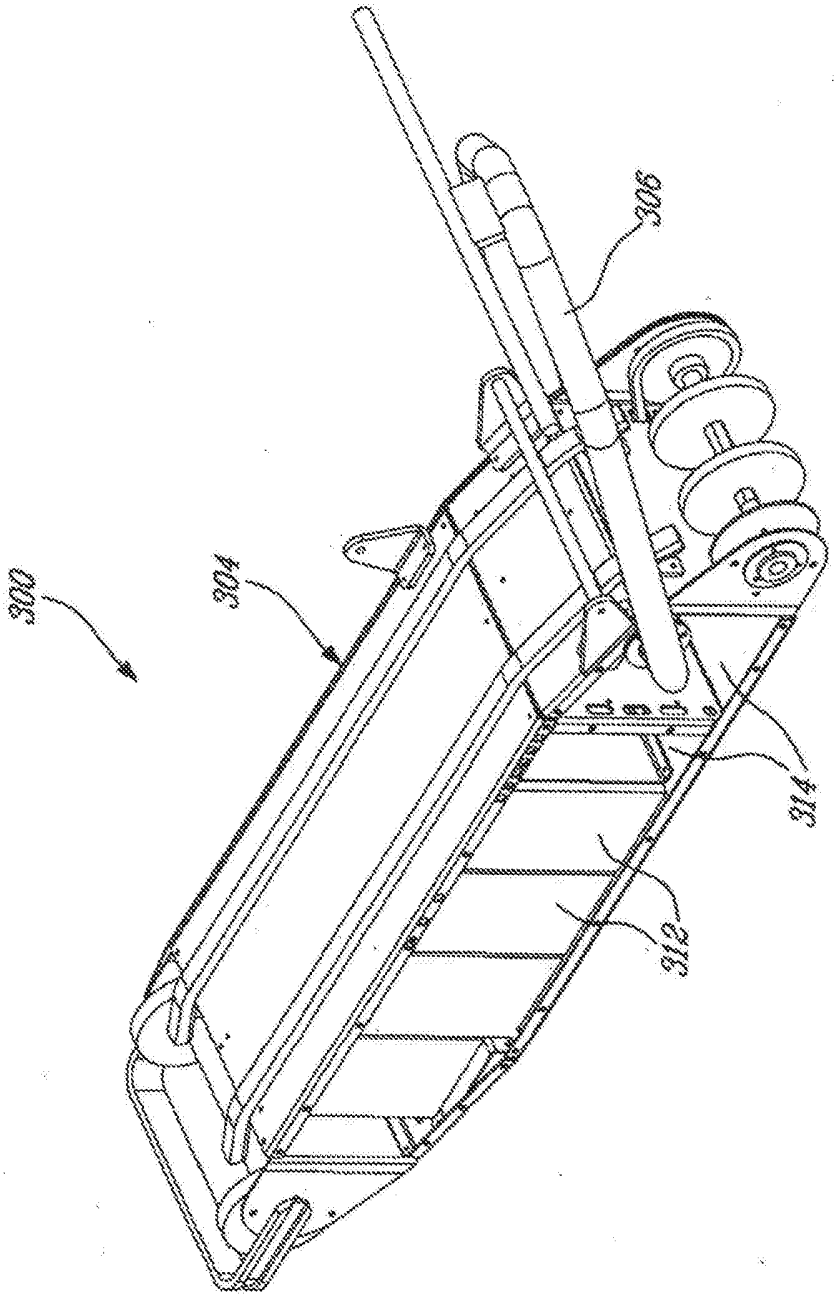

FIG. 11

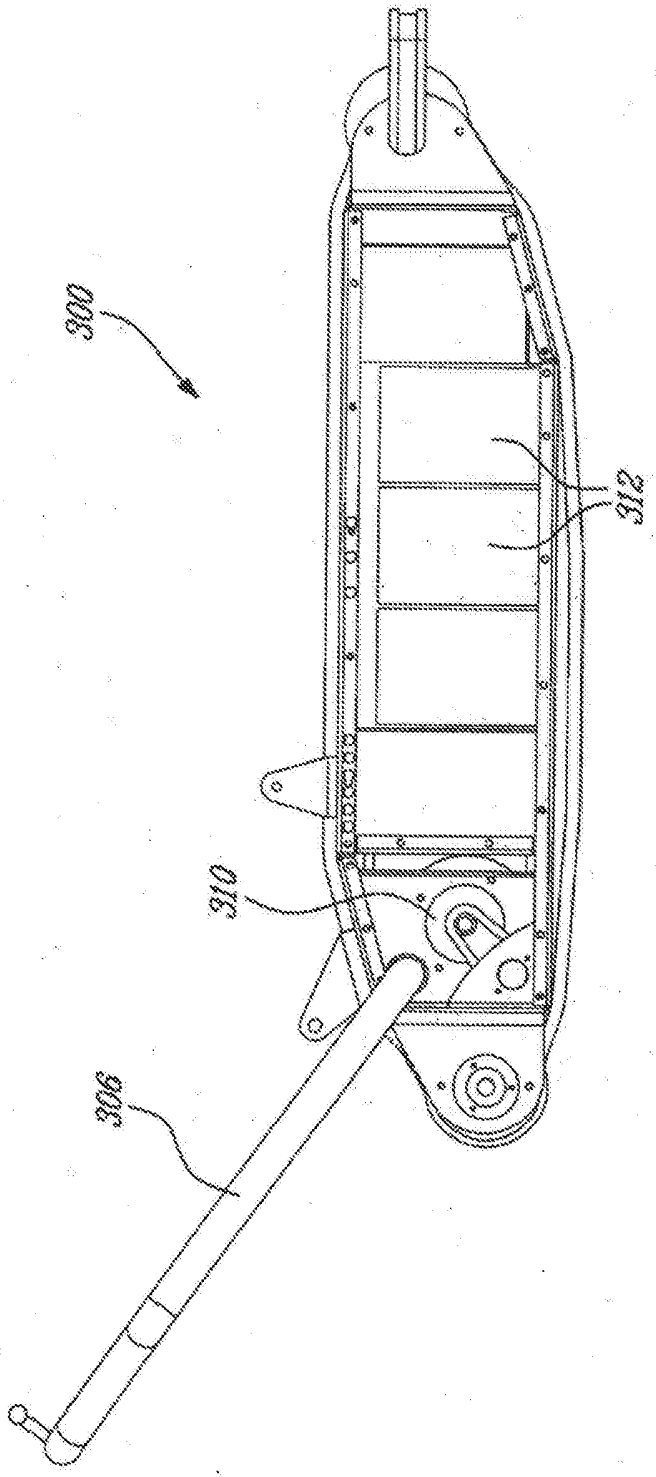

Fig. 12

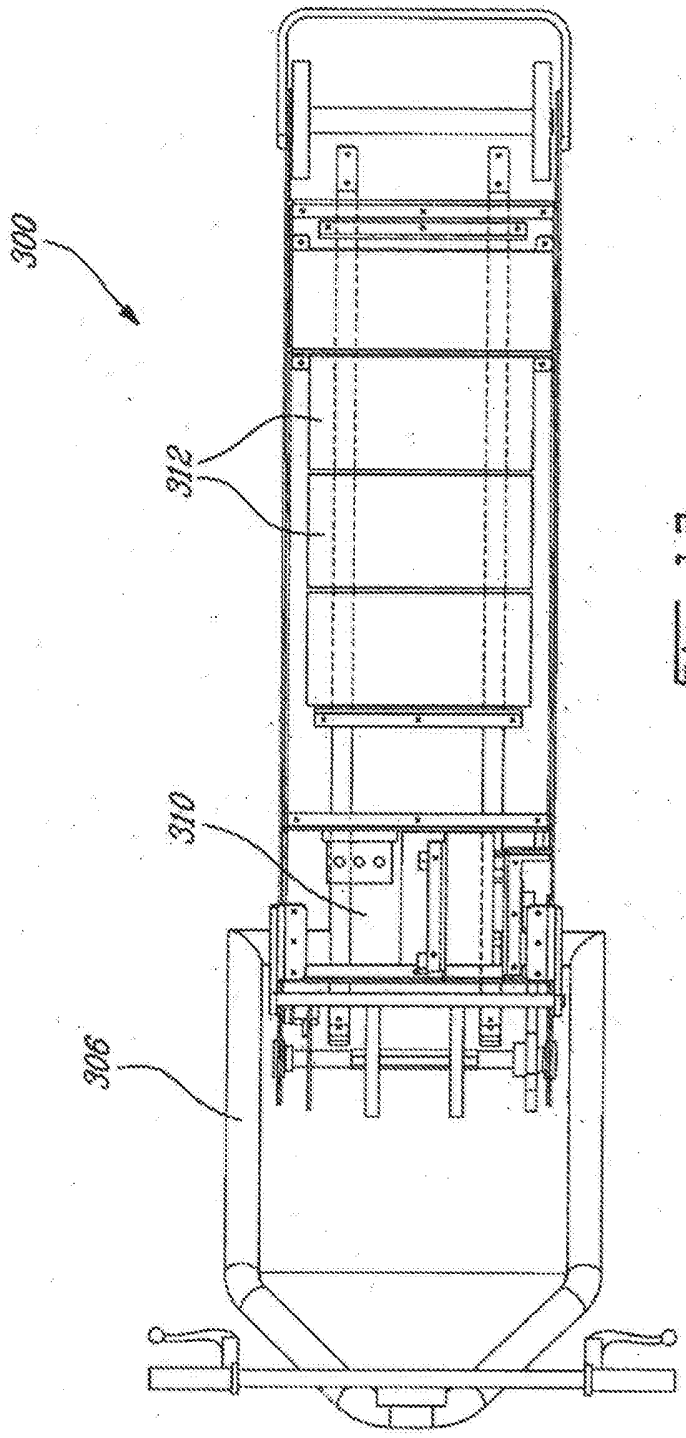

Fig. 13