

1.096.897

PATENT SPECIFICATION

DRAWINGS ATTACHED

1.096.897



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COMPLETE SPECIFICATION

Machine for producing Spheres of Compacted Material, particularly Snow, for transfer by Pipe Line to a Desert Area, for the Irrigation thereof

I, ARTHUR PAUL PEDRICK, a British Subject, 77, Hillfield Road, Selsey, Sussex do hereby declare the invention, for which I pray that a patent may be granted to me, and the method by which it is to be performed, to be particularly described in and by the following statement:—

This invention is concerned with machines for the generation of balls of material from a surface over which it is moveable. The invention is particularly concerned with the production of balls of compacted snow in a Polar region but, obviously, it could be used for the generation of balls of any material which is capable of a certain degree of self adhesion under pressure.

The invention relates particularly to the detailed design of compacted snow ball mashing machines, as referred to in British Patent no 1,047,735, it being required to generate such balls of large size at a continuously maintained high rate of generation, for feeding into a pipeline which, by running down to sea level from an altitude, will give the balls an initial acceleration under gravity, and which, by the fact that the pipeline runs from a geographical location at a higher to a lower degree of latitude, will result in the balls also being accelerated through the line as a result of the effect of the Earth's rotation about the Polar axis, this effect taking place because of the increase in effective radius of rotation about the Earth's Polar axis between the ends of the pipe line.

As made clear in British Patent no 1,047,735, in considering the application from Antarctica to the "Dead Heart" region of Australia, a 10 feet bore pipe line is capable of irrigating to the extent of 30 inches of water annually over 10,000 square miles if the balls can be passed through the line at a mean speed of at least 500 mph. Such a speed requires that the line should be fed with ice

or compacted snow balls at approximately 50 per second and it is to achieve that result that the machines according to the present invention, are primarily intended, but other uses may also become apparent where it is convenient to transfer material by rolling it down slopes in the forms of large balls.

The invention will be made clear with reference to the accompanying drawings wherein

Figure 1 shows a schematic, plan view, of a machine in accordance with the invention, with its upper roof or cover plate removed and parts shown in sectional view for clarity.

Figure 2 shows the snow gate valve and compacting pistons in a different condition as compared to figure 1.

Figure 3 shows a view from the rear of the machine in figure 1 internally thereof.

Figure 4 shows an elevation of the machine, from the side, but with its outer shell removed, on a smaller scale.

Figure 5 shows a view from ahead of the machine looking into the snow plough or scoop leading to the mouth of the machine.

In such drawings the sense of direction has been indicated by regarding the machine as a ship, with a port and starboard side to the left and right respectively looking ahead, and the terms Port and Starboard will be used throughout the description.

Referring to all the figures of the drawings, the operation of the machine, according to the invention, is, in brief, as follows.

The machine is propelled forwards on its endless tracks 30 and 31. A scoop 1 at the front of the machine digs into a snow bed, or other form of material, which is driven through gate valve 2 into a space between pistons 4 and 5. The pistons 4 and 5 are given a synchronous inward and outward movement so that they compress between them

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- snow or other material that has passed the gate valve members 2, such material then in a highly compressed state passing into space 11. From this space it passes into the hemispherical coengaging recesses in a pair of synchronously rotating wheels 8 and 9. The snow or other material is discharged from the wheels 8 and 9 in the form of compacted balls and these balls then roll back along a central channel in the machine, and are discharged from the machine into the groove cut in the surface of the underlying material by the scoop 1. The balls are then free to roll back, or be urged along, such groove to a collecting station at the rear whereat they may be fed into a suitable pipeline.
- The gate valve members 2, as shown in figures 1 and 2, can open or shut upon vertical hinges so as to facilitate the action of the pistons 4 and 5 in compressing the material to a highly compacted mass. This is necessary, particularly with snow, to ensure the balls created are "solid" and so far as possible free of air spaces.
- As shown the machine is driven by two power units, indicated as 6 cylinder, in line, vertical engines 22 and 23, probably of Diesel type. Each engine drives, through suitable reduction gearing, not shown, the wheel 8 or 9 ahead of it, by shafts and gear box 24, 26 and 25, 27 respectively. A transverse shaft is also provided linking boxes 26 and 27 to ensure synchronous, in step, rotation of the two wheels 8 and 9.
- The two engines 22 and 23, respectively, drive air compressors 20 and 21 for applying pressure to the pistons 4 and 5 for precompression of the snow or other material before it enters space 11 for feeding between the ball recess. As shown in figure 2 the pistons are retracted, after release of pressure, by spring diaphragms but any suitable return means might be used and the operation might be hydraulic instead of pneumatic. Some form of valve mechanism, not shown, is also required to apply pressure through pipes 18 and 19 in periodic synchronous action.
- The engines 22 and 23 also drive, by reduction gear boxes, 28 and 29, shafts coupled to the rear wheels of the endless tracks 30 and 31, to Port and Starboard side respectively. These shafts include slipping clutches 34 and 33, whereby one track will move differentially with respect to the other for steering the machine. A further clutch 32 enables the torque from both engines to be combined or enables the torque from one engine to be made to rotate the caterpillar further away from it as well as the adjacent one.
- The balls 13 generated by the machine pass out to the rear along a central trough as shown in figures 1 and 3. Internally of the machine an engineers platform 38 spans this trough, the platform being capable of being used, as indicated in figure 3 by personnel for maintenance of the engines and inspection of the balls being passed out of the machine.
- The engines have their exhaust gases led up to discharge pipes 36 and 37. Above the roof of the engine room there is a control cabin 40 to which access is obtained by ladder 39. This cabin includes a gauge board and controls for manual operation of the machine. The machine, however, is normally intended for remote control by radio emissions from the ball collecting station as described in British Patent no 1,047,735 a radio mast and antennas 41 being provided above the cabin for this purpose.
- To the rear of the machine, there is a platform 41, on which a helicopter 43 may alight, to transfer personnel or stores. It will be clear that the machine on being driven forwards on its endless tracks, will, with its scoop 1, cut away a trough in the snow or other underlying material, back along which the balls discharged may be made to roll to the collecting base station. In this respect the balls are ejected out of their recesses in the moulding wheels 8 and 9 in figure 1, by compressed air passed through pipes 16 and 17 branched from the lines 18 and 19 linking the air compressors 20 and 21 and the spaces 6 and 7, some form of valve means not shown, being used to apply the air pressure to successive recess at the appropriate time. The balls may be arranged to run back to the collecting station under the effect of gravity by arranging for the snow compacting machines to operate over a part of the Antarctic plateau whereat there is a slight upward slope away from the collecting station.
- To give the balls and the trough a hard surface they may be sprayed with a fine jet of water, which will quickly freeze, in the low ambient temperature, to an ice layer.
- As described in BP no 1,047,735, it is intended that the rate of forward movement of the machines shall be governed by amplitude modulation of the controlling radio signals, and a differential rotation of the caterpillar tracks, for steering purposes, being produced by change of frequency of the radio signals above or below some normal frequency range.
- The machine may be modified in any manner so far as its construction is included within the ambit of the accompanying claims. For example, it might be possible for the Diesel power units to be replaced by direct current electric motors supplied with power by trailing cables to a generator established in the base or ball collecting station to the rear.
- WHAT I CLAIM IS:—
- (1) A machine for the generation of balls from the material over which it is adapted to be propelled by its endless tracks, comprising a scoop for driving material into the machine, a pair of synchronously rotating wheels between the rotary surfaces of which the material is forced and thereby moulded

into balls, and a trough or conduit whereby the balls are discharged to the rear of the machine.

5 (2) A machine, as set forth in claim 1, wherein the synchronously rotating wheels have spaced hemispherical recesses in their coengaging surfaces for moulding the balls.

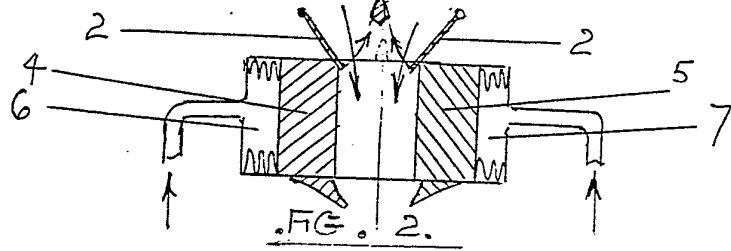
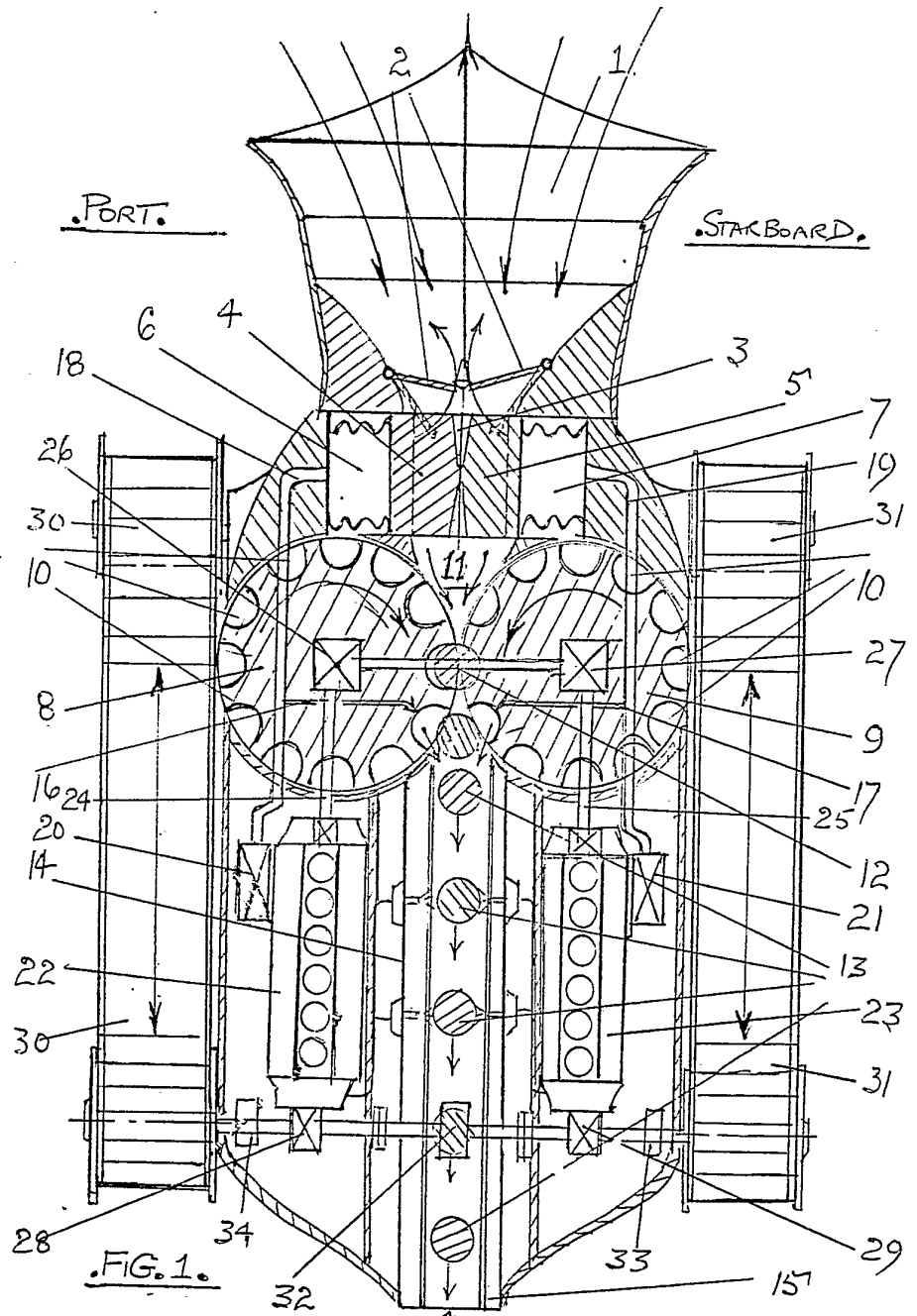
10 (3) A machine as set forth in claims 1 or 2, wherein there are provided piston like members adapted for movement towards, or away from, each other to compress the material driven into the machine by its scoop, before such material is acted upon by the synchronously moving wheels.

(4) A machine, as set forth in any of the above claims, having a servo system whereby its rate of movement ahead may be regulated in accordance with the amplitude of radio signals received by an aerial thereon, and whereby differential movement may be given to the caterpillar tracks for steering purposes by frequency modulation of the radio signals. 20

(5) A machine for the generation of balls of material, as set forth in claim 1, substantially as described with reference to the accompanying drawings. 25

A. P. PEDRICK.

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from which copies may be obtained.



FIG

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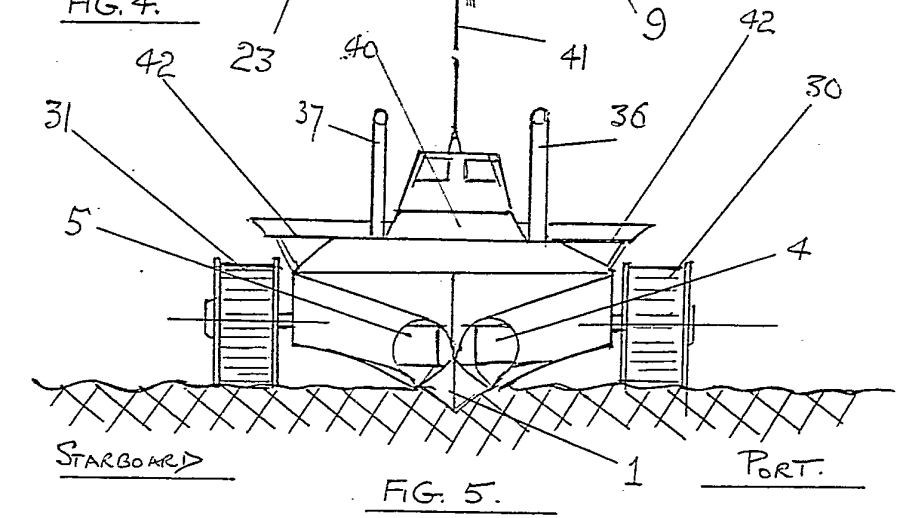
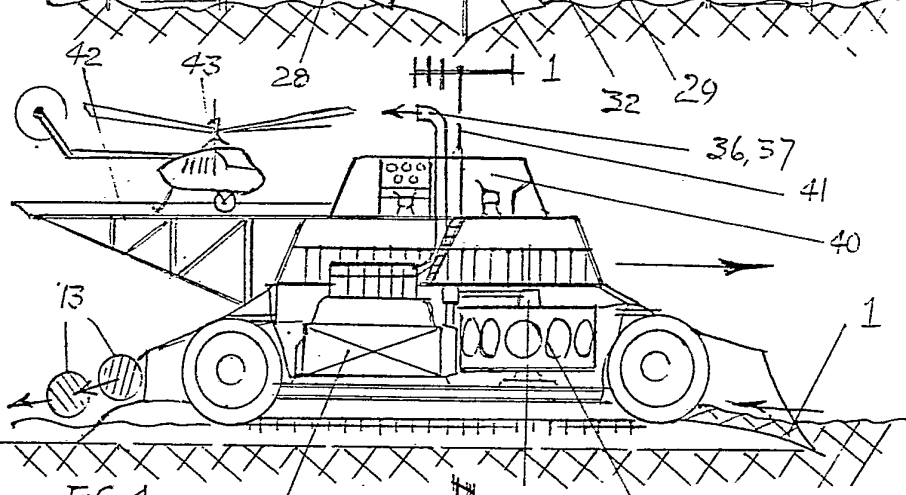
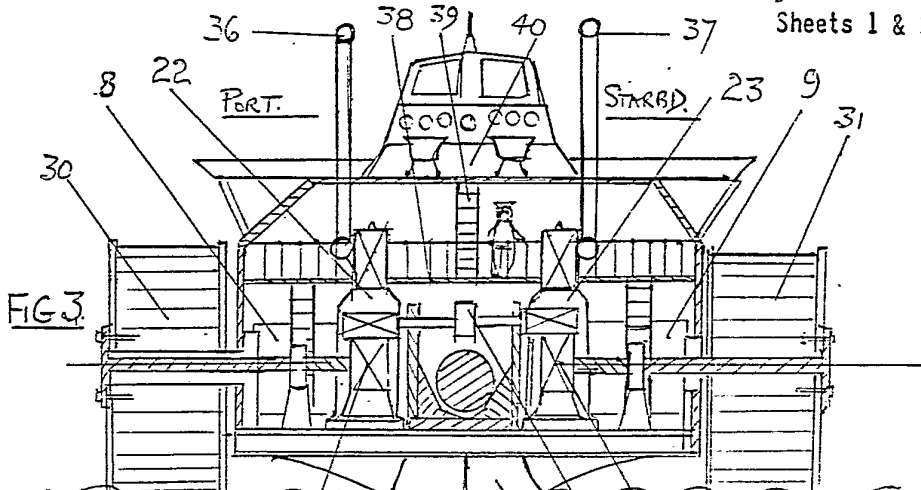
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 2 SHEETS This drawing is a reproduction of
 the Original on a reduced scale
 Sheets 1 & 2

