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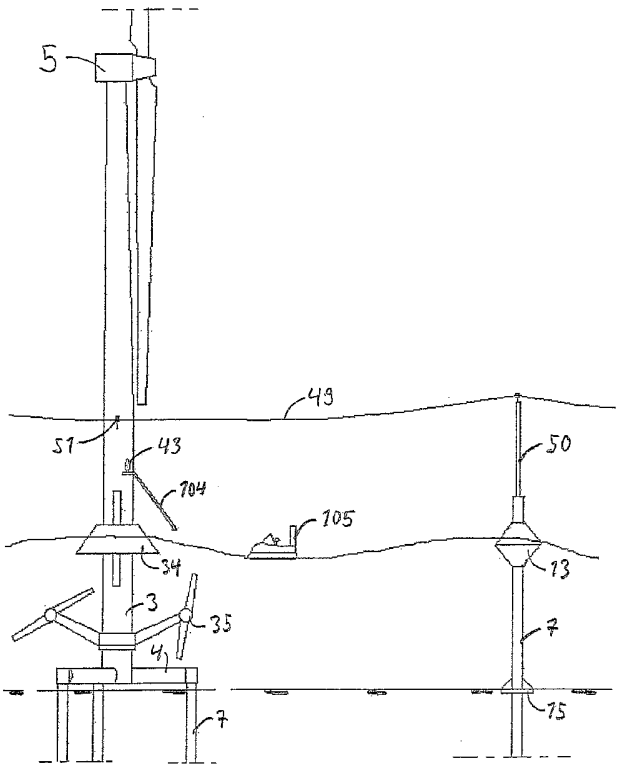
(54) Title: WIND, WAVE AND CURRENT POWER STATIONS WITH DIFFERENT FOUNDATION SOLUTIONS AND METHODS HOW TO MANUFACTURE, TRANSPORT, INSTALL AND OPERATE THESE POWER STATIONS



(57) Abstract: In this document is described to the production of the electricity and fuel cell meant wind (5), wave (34/41) and current (35) power stations with the different foundation types (3/25/4) and the manufacturing, transporting, installing and operating methods for lowering the costs. The wind, wave and current power stations with their foundations are usually transporting in parts by crane ships from the factory and are based and assembled on the sea, and joined to each other by sea cable to the different kinds of units. Wind (5), wave (34/41) and current (35) power stations with the joined tower foundations (3/25/4) will be assembling in the factory or doc to the ready two or three type joint and separate power stations, will be transporting and installing by the air ship (1) or pontoon frame (9) to the production park so, that the joint power stations are in regular distances and the separate power stations are between and outside of the joint power stations, and that way the power stations will be joining to each other by air wires (49), will be maintaining by the air billow boat (105) with the extension ladder (104), the service diver and air locks (62) or by the helicopter or the air ship (1) and will be using from the operative remote control plant, wherein the electronics (65) are assembled in the centrally way. The manufacturing of the parts of the power stations (5/34/41/35) in the cheaper costs level lands and transporting by the air ship (1).

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Wind, wave and current power stations with different foundation solutions and methods how to manufacture, transport, install and operate these power stations.

Object of this invention to the sea park areas meant wind, wave and current power stations for producing the electricity and fuel sell, which these devices conceives in the same foundation the joint wind, wave and current power stations together or the separate power stations alone with the different kind of versions, and which can manufacture in the factory, assembly in the doc and the ready power stations can transport and install by the airship or special pontoon and tugboat to the production place and operate and maintenance easily.

Electricity is producing by the wind power stations, wherein has typically in the head of the tower one vertical rotor with three blades, with the nacelle or without and different kind of solutions for a hub, blades and its warming, also for a main axis, main bearing, gear or no gear, brake, generator and machinery bench.
Foundations are several; a concrete flat, concrete and steal casune, big pile, tree feet tripody and mixed foundations, like a casune with hems or cone casune with piles and different kind of steal pontoons.
The wind power station is transported to the production place in generally with parts in the main land by trucks and in the sea by barge or with special crane ships, and by them the power station will be assembling at the place. Foundations will be manufacturing separately, so it must to dredge the sea ground, change the ground material, divide the ground, also to install piles by pile machines to the ground or anchoring to the rock. Sometimes transporting and installing happens on the top of the ice area. The connection of the electric net is done with immersing the sea cable to the ground by a special installing ship or in the mainland with the air cable in generally way.
Pontoon type of wave power stations are a lot of different kind, wherein by the variation of the wave level the pontoon is able to move back and forth in one or several foundation pile, which is based to the sea ground and is rotating the turbine in the pontoon with different kinds of mechanisms. These kind of power stations are also transported and installed by crane ships.
Current turbines are some, the vertical types with the sea ground based towers or by the wire anchored pontoon types. Transporting and installing happens by the crane ships.
There are also some joint power stations, for example in the foundation of a wind rotor is a current power station or the wind power station is on the top of the air pressured wave power station.
These kind of power stations and their components and different kind of foundation solutions, also joint power stations are in the following patent documents:
NL8201282, US2003/0194310, US6285090, EP0811764, WO03/038275, WO03/082551, US6604907, US4773824, DE10214779, DE19847982, DE19634059, DE19628073, DE19717059, DE19962454, DE10200799, DE10160360, DE19748716, EP1314885, WO03/058063, US6604907, US6619918, S2003/0149584, US2002/0014773, DE2902518, WO0028210, FI894988, FI854427, FI824226, FI830807, FI427131, SE376787, SE179713, SE178274, SE784187, CH543004, DE4134692, DE3422468, DE3343955, DE3244816, DE3133597, DE3116740, DE3043751, DE3043514, DE3027892, DE3027593, DE3025969, DE2934288,

DE2907422, DE2847750, DE2615409, DE2431402, DE19525927, DE2933907, DE2635529, WO0114739, WO0042318, WO9107587, US4151424, US5440176, US4864152, US4850190, US4383182, US4048512, US3930168, US3604942, US833361, US3209156, US4352023, US4302161, US4260901, US4249085, US4196591, US4184335, US4145885, US4009396, US3965365, US3959663, US3758788, US3898471, US3567953, US4073142, WO9400688, GB2338839, GB2272026, GB2311566, GB2117841, GB2037899, GB2004330, GB1589256, GB2283285, GB1563337, GB2348249, GB2164985, GB1557410, DE19515138, DE3108034, CA2438041, US4206601, FI107184, EP1348867, SE376787, GB2039624, NO310767, NO310649, US4320993, EP0287243, GB2306993, DE10021163, US2001/0002757, DE20206234, DE20010086, DE19946899, DE10034847, DE10061916, DE10109040, DE20209000, DE20100588, DE20111441, DE20109981, GB2327970, DE20114909, DE19860211, DE10051513, DE29924401, DE10028513, US990040, US982174, SE303845, US4276481, GB2314124, GB2348465, GB2279412, GB2223810, GB2032009, GB2351124, GB2348250, GB2039624, WO96/00848, DE10053920, DE10126222, DE10150247, DE20117211, DE20008482, DE10103894, DE10113409, US2003/0011197, WO2004/029449, US6705838, WO03/104645, WO03/081032, EP1375913, WO98/53200, US6676122, WO2004/007954, EP1394406, US2004/0041407, WO03/008802, WO2004/027260, WO02/079644, WO03/060319, WO02/057624, DE10219062, DE10223314, WO03/072428, WO03/100248, EP1348867, WO01/34977, WO2004/007955, WO02/088475, US2004/0042876, WO03/093584, WO03/100178, EP1384883, GB2383978, US2004/0031265, US2004/0061338, US2004/0007880, ES2193821, JP2004-60441, WO02/081905, US6652221, WO2004/015207, WO2004/015264, WO2004/022968, JP2004-68638, US2003/0123983, WO2004/022856, US2004/0007881.

To the wind power stations is characteristic the local manufacturing, which increases costs, when lands of cheaper cost level are not be able to use because of the present transporting methods. Instead that the air ship transporting is able to make possible the cheap production, which suits especially to the bulk parts – to hub, machinery bench, tower, foundation.

The transportation and installation is done in generally by crane ships of on the top of the ice area, which increases the costs and being in the grace of the climate, stopping times comes. In the air ship or the pontoon frame ship transporting and installations are not needed the cranes or there are no climate problems – with load the air ship weights over 2000 tons, also in deep in the sea moving a pontoon frame ship, to it does not effect any kind of winds or stormy waves.

Different kind of foundations needs often to dredge the sea ground and/or erosion stone work, piles concrete and steel, which these all must do in the sea and that increases the costs. This patent application's foundation solutions needs only a small pile barge or a special deep pontoon ship, and to it waves does not effect and from it the general pile machine can be able to hit or rotate these piles to the ground without steels and concretes in all kinds of sea ground circumstances, also with a rock anchoring edge. These piles will be cut quite in the sea ground level, so the ground material fills the steel piles and torsional moments does not exist, as in the piles, which are out very high level of the ground. When a special tripody or a big pile foundation will be laying to the top of the piles and is going to weld to the piles by

a bulkhead, the installation from the air ship is very quick and cost effective. Also the typical bevel pipes of the tripody has been taken off from the foundations by increasing the diameter of the horizontal pipe, so the pack ice does not go under to the supporting pipes. In the present times the foundations are manufactured with the separate way, but now the foundation is for example one part of the wind power station, so the foundation will be installing already in the doc and the power station will be transporting like in whole one piece directly to the piles in the sea bed. There is no need to come twice to the same place, only with sea cable. There are no a special foundation pile, instead a pile of the tower can be look to go to the lowest point of the tower as in the manufacturing way and to the tower pile will be welding three horizontal steel pipes. A special erosion steel plate in the pipes removes the stone collection and installing in the ground based foundation. Also among in the pile work the ground materials comes up, and that can be eliminate and make stronger the pile connect to the ground by welding outside of the pile a horizontal flange to near of the ground surface, and that way the flange squeezes the ground material thigh in the last pile ramming. In the drilling pile can be able to use in their front heads special horizontal blades, which make them firm and reduce the lifting powers of the piles.

Pontoon solutions are many, but it be worth to do the pontoon to the same serial types with other foundation solutions, by doing the same kind of serial types it will be increasing the profits of the productivity. This patent application's pontoon foundation is a pressure air and weight load technology, and that is done possible by it's own structure of the foundation. The air foundation fastens with very tight way even a very big wind, wave and current power station to the sea ground in the ice pack areas by pipe piles with wings and fastening wires, so the own weight of the power station and the foundation does not feel anywhere, when the pontoon foundation is filled by air and it is dragging with it's power the whole structure only to upwards.

Pack ice cones are made by a concrete or steel, both to the up and down bevelling directions, a whole round or half round shaped. Now the pack ice cone can do in the best way by lighter than concrete – with a steel material and with double parts, which bevels up and down. That way it can avoid the packing ice which causes dynamic loads. From the ice cone it can be able to do also one or two part wave power station, which effectives the costs.

In the wind power stations are using two part laminated blades, which are heavy and that way its length is difficult to increase because of the structure and costs. Now it can be able to make a lighter one by dividing the blade to a supporting part and a form panel part or it can be able to make these two laminated parts of the blade with the modified way by doing a air chink between these parts with a vertical supporting plate, and that way it can get with in the same amount of structure and cost more wind surface area and it will be bringing more power.

In the warming system of the blades are using the warm wire elements, which are expensive and very accurate to install exactly to the icing places of the blade. Besides the ices can broke these wire elements in the outer surface installing. Now in the hub is a hot air blower, which avoids these kind of problems and saves costs. A glass fibre and carbon fibre blade keeps the hot air inside the blade a long time, which is saving the production of the electricity. In the blade angle and active bitch control of the blade is unnecessary to use a whole round gear wheel, a third of that is enough to 90 degrees, in the turning the blade to face the wind in flatways or front lead side of the blades can be able to turn to the wind, and it can assure by a brake, and instead of that

not to turn 180 degrees the back side of the blade to the wind. Also the springs and hydraulic backing system for electricity black outs can be replace by own battery of the reserve electric current system, which is using the turning motors of the blade, especially if there are wave power around, which already can have the battery.

Solutions of the wind power station for a hub, main axis, main bearing, different kind of gears, brakes, generator and machinery bench are too complex and are the same construction, and they don't make possible a proper maintaining and fixing methods in the place where they are existing and they avoid the replacement in single devices by a helicopter without that the whole nacelle has to transport by crane ship to the factory and rip it to the pieces.

Now all the parts are in separate and modulate way and they can be able to replace alone; the hub is fastened without the main axis to the structure of the gear, and it has surrounded by the main bearing and the hull frame of the T-shaped machinery bench, also the brake is between in the bolt flange coupling of the axis of the generator and gear. Nacelle no needed, the electronics of the protector, control and regulator system is in centrally way in mainland's operative remote control plant in the wind park, so it will be need particularly only one devices or devices can be in the tower's lowest point of the wind power station. When wind parks are erecting, it can increase park's power in the favourable circumstances with wave and current power stations, which are fastened to the wind power station. Also in the are of the park , it can install separate wave and/or current power stations, and that way the park's area using comes more effective and in the same time the grid connection costs goes down. The grid connection has to do always by a sea cable in the sea bed, which is expensive. But if there are used separate wave and current power stations, where the electric air wires are on their towers, it lowers the costs. It can also use on their own towers the separate electric air wires, and to them can be fastened the ice cones. With the pack ices it can be very difficult to come to wind power station, if the device broke happens and that lessens the operating time. But now the service door is in a higher place in the tower and with a special ladder which reaches long, and with a small air billow boat can get to the power station always without depending on the pack ices. A bigger device fixes by the helicopter.

In the current power stations are used often the maintaining and repairing methods by lifting up a nacelle of the power station or the whole construction from the sea surface or to the same sea level. Now the smaller maintaining can do with a service diver by a air lock without moving the power station. The bigger repairing can do by lifting a released nacelle or the whole power station with pontoon solution to the sea surface so that it's service doors rises upper than what the sea surface is that way that the water splashes doesn't bother. Or by the helicopter with pieces or by the air ship lifting it directly up and transporting the whole power station to the doc. In the sea there are no sense to operate bigger repairing.

Pontoon types of the wave power stations are different kind, but solutions which endurance a rough sea, are very few. The pressure air and water weight load tank technology makes possible the rough open sea endurance in storm times by lowering the wave power station to a bottom of the sea bed and lifting it up when the storm is over. With the pressure air and water weight load tank technology can also increase the power by using with bigger waves an another bigger generator, and with smaller waves a smaller one. The hydraulic brake technology if needed especially if the wave power station is like a ice cone, can the power station stopping to the certain level in

the tower, so if there are no waves but ices a lot, the wave power station functioning very well being as a ice cone and it doesn't sink by the ice load to the under the water surface. Also with the maintaining and repairing time the power station can be stopped still, so the operation working can succeed from the ship or helicopter in any kinds of weather, but the stopping of the wave power station must happen from the wave crest. With the big wave power stations can use a main pile which is manufactured with a joined construction made by a steel and concrete or steel concrete only or pre stretched steel concrete. The wave power station can be almost invisible from the sea level seeing by using a pontoon pipe version for example where are the settlement near.

In according with the inventions of the wind, wave and current power stations and their foundation techniques and with all of those manufacturing, transporting, installing and operating methods, their meaning is to eliminate a typical faults of the technology and production, to increase the power of the production park and power station unit, making easier the maintenance and bringing that way the cost effectiveness, and that way meaning is to reach the basic power production price level in the electricity market.

The mentioned benefits will be reaching by the technical and productivity solutions in according with the inventions and their methods, which are known from that what are presented in the distinctive mark part of the patent claims.

Inventions and their methods are explained closer in the follow by appended pictures.

Figure 1 presents an air ship, its transport scaffold and towers and foundations of wind power stations.
Figure 2 presents the air ship lowering a ready wind power station to piles, which is assembled in the doc, and a deep pontoon ship, which is drove the piles to ground.
Figure 3 presents a barge, which is pulling a pontoon ship to be as a power station's transporting and installing method direct from the up observed.
Figure 4 presents a barge pulling the pontoon ship, which is transporting a wind and wave power station direct from the side observed.
Figure 5 presents a foundation of the power station, where are a double part ice cone with three pile foundation.
Figure 6 presents a foundation of a power station with a usual ice cone, where are tripody like three steel pipe feet and piles.
Figure 7 presents a ground based steel pipe sole foundation of the power station with usual ice cone and erosion plates.
Figure 8 presents a pontoon foundation of the power station with the usual ice cone, which is anchored to the sea bed by piles and steel wires.
Figure 9 presents a concrete pillar foundation of a big wave power station, which piles are drove to the sea bed.
Figure 10 presents a concrete pillar which are sank to tripody like foundation of a steel construction.
Figure 11 presents in accordance with figure 7 a cutting of the erosion plates directly from the front observed.

Figure 12 presents a drive pile and its outsider ground tightening flange and wings of a pile.

Figure 13 presents in accordance with figure 5 the pile, a hat of the pile and a cut fasten part detail of the tower in the side of the power station.

Figure 14 presents a cutting point of the droved pile, which are anchored on the rock by a diamond edge.

Figure 15 presents a wave and current power station, which are connected together with a joint foundation.

Figure 16 presents a invisible wave and current power station, which are connected together with a joint foundation.

Figure 17 presents a current power station with a double rotor, which are based with different kind of foundations to the sea bed.

Figure 18 presents a three rotor type current power station, which is anchored by a wire wince and piles to the sea bed.

Figure 19 presents in accordance with figure 18 a current power station directly from the up observed.

Figure 20 presents in accordance with figure 6 a tripody like foundation, which in tower are a three rotor current power station.

Figure 21 presents a swinging pontoon type foundation with in accordance with figure 20, where is a three rotor current power station, and to that is jointed a pack ice cone like wave power station, which are bevelling to two direction and its tower functions also as a air wire pillar.

Figure 22 presents a swinging one rotor current power station, which is based to the sea bed by wire wince and concrete foundation block.

Figure 23 presents a cutting point of wind power station like nacelle and rotor of the one rotor current power station, which is based to the sea bed by the tower and foundation, directly from the side observed.

Figure 24 presents a variation of wind power station like one rotor current power station, which is based to the sea bed by the tower and foundation directly from the side observed.

Figure 25 presents in accordance with figure 15 a pack ice free nacelle of the wave power station directly from the up observed.

Figure 26 presents in accordance with figure 21 a bigger nacelle of the wave power station, which is functioning in the way of a pack ice cone directly from the up observed.

Figure 27 presents in accordance with figures 21 and 26 a double part wave power station with pressure air and weight load tank technology directly from the side observed.

Figure 28 presents an alternative pack ice cone free wave power station with pressure air and weight load tank technology directly from the side observed.

Figure 29 presents in accordance with figure 16 a nacelle of the remain hidden wave power station directly from the up observed.

Figure 30 presents in accordance with figure 16 and 29 a cutting point of remain hidden wave power station directly from the side observed.

Figure 31 presents a wind, wave and current power station with a tripody type pile foundation, in which making certain to get over of the be heaped pack ices by a service door which are in high level of the wind power station and by its special

ladder, also the service man in his air pillow boat and air wires with double pack ice cone pile, which is based to the sea bed.
Figure 32 presents a cutting point of the nacelle of the wind power station directly from the side observed.
Figure 33 presents a in accordance with figure 32 a machinery bench, a service plane grate, a direction bearing and a direction motor of the wind power station directly from the up observed.
Figure 34 presents an air warming blower's function of the wind power station, which is in the hub of the rotor, and its purpose is to prevent the icing in the blades, in accordance with figure's 37 blade directly from the up observed.
Figure 35 presents one of the regulation motor, which is in the hub of the wind power station and its third part teeth wheel's cutting point directly from the side observed.
Figure 36 presents an alternative modulated nacelle of the wind power station, its cutting point directly from the side observed.
Figure 37 presents a cutting point of an alternative hub of the two or three blade rotor of the wind power station and its nacelle directly from the side observed.
Figure 38 presents a blade profile of the wind power station, its cutting point directly from the side observed.
Figure 39 presents a variation of the blade profile of the wind power station, its cutting point directly from the side observed.
Figure 40 presents in accordance with figure 39 a blade, which is cut directly in the length direction of the blade.
Figure 41 presents a profile of the double blade of the wind power station, its cutting point directly from the side observed.
Figure 42 presents in accordance with figure 41 a double blade directly from the side observed in the length direction way of the blade.
Figure 43 presents different kinds of variations of the shaped blades of the current power station directly from the up observed.
Figure 44 presents in accordance with figure 43 one of the side profile of the shaped blades of the current power station directly from the side observed.
Figure 45 presents in accordance with figure 44 a shaped blade of the current power station directly from the blade's end head observed.
Figure 46 presents a side profile of the double blade of the current power station directly from the side in the length direction way of the blade observed.

The steel pipe 7 is stroke to the ground of the sea bed or drilled to the rock. To the piles 7 is fastened the outer horizontal flanges 15 in the sea bed level, which in the last ramming strikes tightens the ground material from the around and inside of the pile 7. The piles 7 is fastened by welding seam 31 to inside the spacious pile hats 14, which are in the outer side of the tower 3 in vertical way, so the piles installing measurement faults doesn't matter. The pile 7 in fastened to the top surface of the pile hat 14 and to the lower part of the pile hat 14, making that way a firm structure. To the tower 3 is fastened a flange stopper 40, and to it is supporting a mountings 39 of the current power station 35, which is around the tower 3 that way, that the current power station 35 can turn in the same direction with the tidal stream. Both sides of the mountings 39 is fastened in bevel way pointing to the upper direction supporting arms 38, which functions also as a pressure air and weight load tank 97, when the power station 35 is lifting up because of the service procedures. Supporting arms 38 points up, because it

makes possible to maintenance the nacelle 53 of the current power station 35 in the above of the sea surface, when these arms 38 floats in the tower 3, so the water splashes doesn't matter when the service doors 43 are open. The nacelles 53 of the current power station 35 are fastened in a horizontal way to supporting arms 38. To the nacelle 53 is joined a hub 114 of the rotor 37, in where the blades 36 are in the ordinary way. The tower 3 continues up as a joint structure from the current power station 35, so in the surface of the sea level is a wave power station 34, which is joined to the tower 3 by three wheel and teeth bars 82 and 89 that way, that the bars 82 and 89 is fastened in the opposite way of each other to the tower 3, which is in the vertical position. That way the wave power station 34 slides by waves up and down with the six horizontal axes 88, which are in up and down sections in the wave power station 34. In one of the upper axis 88 which goes to generator 64, has two wheels 85 in both side of the teeth wheel 86 and all in five other axes 88 has only one wheel 85 each. Axes 88 is joined to inside of the hull 83 of the wave power station 34 by bearings and stefas 84. These five axes 88 in the upper section of the wave power station 34 does not continue from the inside hull 83, but the previous mentioned one upper axis 88 continues from the other end to inside to the nacelle's 53 side of the wave power station 34, and to it the axis 88 is joined a coupling 87, brake 69 and a planetary gear 71. The planetary gear 71 is in the axis 88 which goes to the generator 64, which is fastened to a floor of the nacelle 53 by supporting balks 67. In the nacelle 53 is a battery 90. The electronics 65 is in the centrally way park's operative remote control plant in the mainland. The shape of the wave power station 34 can be every kind, for example a shape of square walls 81 with a flat floor and roof. From the wave power station's 34 part the tower 3 continues with a form of joint structure to a service door 43, which is in the upper section than what the ordinary level is in the wind power station 5 and continuing to its long distance remote control and continuation ladder 104, wherein the service man fastens with his air pillow boat 105.The ladder 104 is packed in the straight vertical way to the tower's 3 side, wherein they are be able to pull and continuing by long distance remote control to the down bevel motion over of the pack ice heaps. The tower 3 continues with the form of joint structure to upper section, where is in the opposite side of the service door 43 in the tower 3 a air wire cramp 51, which is fastened to the tower 3 and from it is pulled a insulated electric cable 56 to inside of the tower 3 up to the generator 64. The cable 56 goes from the air wire cramp 51 also in the outside of the tower 3 to the wave power station 34 and goes inside from its wall 81 to the side of the nacelle 53 to the generator 64. The cable 56 can be in a reel, which is not drawn, because the wave power station 34 moves up and down. From the air wire cramp 51 an another cable 56 also continues in the side of the tower 3 and between in the wave power station 34 and tower 3 in the pipe forward to the current power station 35. The cable 56 branch of from under the wave power station 34 to both nacelles 53 of the current power stations 35 and to those generators 64. In the cable 56 has to be a slack because the service upping of current power station 35 to the sea surface level. The air wire 49 continues from the cramp 51 of the wind power station 5 to the next mere wave and current power station 34/35, its head of the tower 3 where is fastened a pillar 50 of the air wire cramp 51. The air wire 49 continues from the wind park's power stations to mainland by separate air wires 49 with double ice cones 13 in the piles 7, and to their heads is fastened pillars 50 and their heads air wire cramps 51 or the electric net connection can be done with ordinary way by ground cable. From the air wire cramp 51 the tower 3 continues with joint

structure way up to top of the wind power station 5, where the tower 3 fastens to a directing bearing 122. The directing bearing 122 is fastened to a T-shaped machinery bench 110. A directing motor 119 is fastened by its joint ring to the bench 110. A rounded teeth wheel frame 120 of the directing motor 119 is fastened to top and inside of the tower 3 with horizontal way. To the bench 110 in the middle of the tower 3 is fastened service ladder 121 reaching to down in the tower 3, and in it is the insulated cable 56 from the generator 64 going down also to the outside of the tower 3, where is the air wire cramp 51, and the cable 56 joins to the air wire 49. In the bench 110 is fastened around the generator 64 in the horizontal way a service grate 109 leaving to the service man an opening under and side of the generator 64. The supporting balks 67 of the generator 64 and the brake 69 by pillar are fastened in the bench 110. The generator 64 is placed little bit up bevel way against to the rotor 37 in a horizontal position in the bench 110 and is axed to the planetary gear 71 by bolt flange joint 59, and between the joint is a disk of the brake 69. In the top of the generator 64 is fastened a cooler 107 to outside of the nacelle's case 108. In the top of the cooler 107 are meteorologycal devices 106. In the front horizontal balk of the bench 110 is bolt fastened a rounded frame balk 111 of the main bearing 112 in the vertical way with a little bit backward position. In the side of the balk 111 is the main bearing 112 and in the front is bolted with a sealing a front hull casing 70 of the gear 71, where the teeth wheels of the gear 71 is fastened with bearings. The hub 114 of the rotor 37 is functioning like a big diameter steel pipe in up bevel way axis in horizontal position, which is fastened inside of the main bearings 112. Inside of the hub 112 is bolted the gear 71 to the point of the main bearing 112 and the balk 111. In the back of the gear 71 inside of the hub 114 in vertical way is a shelter wall 73, wherein is a service door 115. The hub 114 is cut and fastened by bolts with inner flange to the shelter wall 73. In the hub 114 is in ordinary way fastened three blades 124 of the rotor 37 to a bolt mountings frame 118, wherein is fastened a third part rounded teeth wheel 126. In the hub 114 is fastened own directing motors 123 of the blades 124, which are warm insulated and which are in the teeth wheel 126. To the ice preventing of the blades 124 of the rotor 37 meant the air warm blower 117 is fastened to inside of the hub 114. The case of the nacelle 108 is fastened to the top of the tower 3 to under the directing bearing 122 and the case 108 is shaped that way, that it leaves a service space to outside of the devices. In the case 108 in the roof section is a service door 116, and from it can get to the cooler 107 and meteorological devices 106, also to inside of the hub 114 from the front of the shelter case 113 where are also the service door 116. The shelter case 113 of the hub 114 is shaped like a blunt cone and it is fastened around to front of the hub 114 in the ordinary way. The shelter case 113 is fastened from the sealing part of the hub 114 of the rotor 37 to around of the frame 111 and is shaped like a roof way around the shelter case 113 and is above in the upper sections of the shelter case 113 covering from the bevel rain. The blades 124 of the rotor 37 is shaped for example like a NACA-blade profile and their structure are lighter models, where are individually carrier structure and shelter case parts. Then carrier structure plate 127 starts from the half point of the upper part of the blade 124 which is curving to the front and under of the blade 124, and the shelter case part 128 is in the back of the carrier structure part 127. The structure part 127 and the shelter case 128 connecting together by glue in the ordinary way. The structure part 127 continues in the root section of the blade 124 to the supporting pipe part 129, and by that the blade 124 fastens to the hub 114 with the ordinary way. The shelter case 128 ends a little bit

before the pipe 129 and joining to the pipe 129. Inside the blades 124 rounds a warm air 125 because of the ice preventing. The electronic 65 in the park is in the operative remote control plant or in the down section of the tower 3, with a battery 90 of the wave power station 34, which functions like a reserve electric current system. Uniformed battery 90 can be also in the wave power station 34. In the front hull case 70 can be also a double part service door 115.

In the cheaper cost level lands manufactured and assembled towers 5 and foundations 4 of the wind power stations 5 are transporting by the cargo use meant air ship 1, which lifts in the doc assembled parts to its scaffold 2 by its wire winces in the ordinary way.

In the nearest doc of the production place of the wind park are assembling a technical parts of the power station to the bulk parts and the ready wind power station 5 is lifting in the vertical position by air ship 1 with the lift frames 6 equipped the ordinary tackles and wires, and is transporting to its production place directly to head of the piles 7 and is welding to pile hats 14. A special drive pile pontoon ship 8 is hitting beforehand the piles 7 to the sea bed and is using the measurements of the pile hats 14 of the foundation 4, so the air ship 1 don't get to wait the drive pile assembling. The air ship 1 can lift several wind and joint power station 5/34/35 at one time and can install them to their places. The foundation 4 functions as a big pile or tripody foundation overall, but now instead of only one big pile, there are three ordinary size piles 7, which are little bit wider circle around the tower 3 giving this way a bigger torsional moment.

The current power station 35 is a typical double rotor with that difference, that in the service action the lifting of the power station 35 happens by pressure air and weight load tank technology 97 and the supporting arms 38 of the rotor 37 are up in the bevel way, because in the sea level these nacelles 53 will be lift above the sea level to getting an easier operation. Besides in the mountings 39 can be a hydraulic brake 91, which is not drawn, in which the power station 35 can be hold in the certain height, for example the stopping in the ridge of the wave. In this way the oscillatory movement of then waves can be eliminate. This is important in the helicopter or air ship lifting, from the ship done lifts the power station 35 can swing in the same tempo with the ship. Other reason to use the bevel arms 38 is that, that when the wave power station 34 is above, the mountings 39 has to be in lower position than the nacelles 53, when the mountings 39 come in to contact with the bottom of the wave power station 34 in the lifting up of the current power station 35. The sea cable 56 of the current power station 35 can go outside of the power station 35 and to up to the air wires 49 or down to sea bed to sea cable. This doesn't matter although the current power station 35 changes a little bit its direction with the tidal stream, a whole round the power station 35 doesn't do. The opportunity of the direction changing with the mountings 39 is important, because in the opened sea areas the direction of the tidal stream changes little bit, only in narrow coastal especially in the tidewater direction changes does not barely exists.

Functioning like a pontoon the wave power station 34 functions around the tower 3 cooperating with wheel and teeth wheel bars 82 and 89, wheels 85 and teeth wheel 86 and going up and down with waves and that way transmitting the kinetic energy of the waves by axis 88, coupling 87 and gear 71 to the generator 64. The brake 69 stops the wave power station 34 to ridge of the wave when the service time is or if a device

broke happens, automatically by computer program. When the wave power station 34 is changing its direction, the movement stopping causes an electric tension lack out, so the electric current is feeding at first to the battery 90 and/or fuel sells, and from it to a frequency converter before feeding it to the electric net. The inevitable electronic of the protector, control and regulator devices with its anture 65 is in the nacelle 53, and the rest of the central electronics 65 is in the operative remote control plant. The cable 56 is outsider so, that in the pack ices the cable 56 has to be between the tower 3 and wave power station 34 and go up in the pipe to the air wire 49 or down to ground cable. A service door 43 of the water proof nacelle 53 is in up deck of the wave power station 34. To the top of the wave power station 34 gets by assembled latter, which is not drawn. The packed ice in the top of the wave power station 34 doesn't matter the service action or functioning, because usually in that time there has no waves. so the power station 34 is not functioning. On the waves and tempest pack self ice unusually gets to existing packing for example to the top of the ice cone.

The accessibility to the wind, wave and current power station 5/34/35 is possible in all weather conditions by air pillow boat 105, so stopping times can't happen because of the device broke. The device switches can take care by helicopter. And to the wind power station 5 can get and over the pack ices by service door 43 and ladder 104, which are upper than ordinary.

The air wires 49 follows in the electric net operating the typical authority orders and pack ice duration pile technology 7, in which is a double part ice cone 13. Always certain the durability is, if it can use at least the separate wave and current power stations 34/35 with a part of the wind park, then the air wires 49 can be found to the tower's 3 head of the power stations.

The wind power station 5 can be in the joint power station any kind, for example the wind power station 5 functions in the ordinary way, the difference is a reserve stopping and warming system of the blades 124. Under the part of the tower 3 in the wind- and wave power station 5/34 is the battery 90 for the reserve electric current system, which in the electric black out use turning motors 123. The automatically functioning warm blower 117 starts and ends because of the ice forming and melting notices of the ice antures of the blades 124. The heat lasts long in the glass and Kevlar™ fibre blades 124 and shelter cases 113. The heat insulate existing for the turning motors 123 because of the blower 117. Besides when the hub 114 is warming, it is useful to the problematic lubrication of the main bearing 112 and gear 71 in the arctic circumstances. The turning motor 123 of the blade 124 functions in the ordinary way, instead the teeth wheel 126 and also turning possibilities of the blade 124 limits to the third part from the ordinary. The blade angle and stalling regulative blade 124 needs 10 – 15 degrees and with the whole blade 124 done air braking 90 degrees turning angles for stopping the rotor 37 and assure it by the brake 69. The structure and shelter case parts 127/128 of the blades 124 don't effect to the functioning, but with that structure and material choices it can making possible the extension of the blade 124 in the cost effective way. The bolted gear 71 can remove by the double front structure case 70 with the service doors 115. The main bearing 112 can be loose from the horizontal balk of the bench 110 with the balk 111 and gear 71, as long as the rotor 37 with its hub 114 is loosed first.

Next is explained the inventions alternative technical and productivity solutions:
Figure 3 presents the barge 12 pulling the pontoon frame 9 for ready power stations 5/34/35 to transporting and installing from the doc. To the side of the pontoon frame 9 is fastened for example six fastening frames 11, which can be open from the point of the tower 3 of the power station 5/34/35, in where are in the opposite way of each other a soft surface hydraulic pressers 10, and by them it can hold these power stations 5/34/35 a suitable high level. In the transporting the hydraulic pressers 10 is pressing against the tower 3 and in the installing the grid will be loosing, so the power station 5/34/35 can go down to the sea ground by its own weight. For example the neoprene rubber surface of the pressers 10 don't harm the surface of the tower 3. The fastening frame 11 will be open and the pontoon frame 9 moves to the next production place with its left power stations 5/34/35. In the water pool of the doc, where the pontoon frame 9 is waiting, the crane of the doc lowers the ready assembled power station 5/34/35 and fastens to the fastening frame 11 by opening and closing the frame 11. The barge 12 transports the power station 5/34/35 by the pontoon frame 9 to the production place and the pontoon frame 9 lowers the power stations 5/34/35 to piles 7 in the sea ground with its own placing motors, which are not drawn. With the pressure air and weight load tank technology 97 the pontoon frame 9 regulars its swimming level basing by the load of the weight and the structure, deepness of the water and the wave highness. When the pontoon frame 9 swims in deep with its pontoons the sea motion doesn't effect. Broad foundations 4 and for example wave power stations 34 are under the pontoons.
Figure 6 presents a tripody like foundation 4, wherein the typical bevel supporting pipes are removed from three or more pipe, balk or grating horizontal feet 17, which are fastened to the tower 3 like that. In the head of the foot is in a typical way the pile hats 18, now only with more space because of possible installation faults of the piles 7. The usual ice cone 16 can be belong with the tower 3.
Figure 7 presents in according with figure 6 a ground based tripody like three or more feet foundation 4, in which has three or more pipe, balk or grating horizontal feet 19 with special erosion plates 20, which are fastened to the feet in the horizontal direction way and which spreads in the bevel way around and to the side on the feet 19. Plates 20 sinks deep to the ground by the weight of the foundation 4 preventing that way the ground material go by from under the feet 19. The construction doesn't be different just at all from the ordinary house building sole, which is solid and sure construction.
Figure 8 presents the pontoon foundation 4, which is needed on the deep water. To the sides of the ordinary tower 3 is fastened three or more a horizontal pontoon pipe or balk 21, and to the head of the pipes 21 are fastened the wire winches 22 equipped with motor and remote control, which can be operate from the sea surface. The wires 23 are anchored to the foundation 4 in the sea bed by piles 7, in which possible has wings 29. The wires 23 are fastened to the holes 24 of the piles 7. The feet 21 and the tower 3 are functioning with pressure air and weight load tank technology 97, so the structure becomes a solid, firm and is enduring bigger loads. The piles 7 is good to equip with pile wings 29, that way the pulling forces doesn't lift up the piles 7 from the ground.
Figure 9 presents a big alliance structure or steel concrete or pre stretching steel concrete basic pillar 25 of the wave power station 34, to it in the solid way is joined in the same casting a concrete sole 26, in which in the casting to the corners of the sole

will be fastening by welding seal 31 or bolting by horizontal flange 28 that way, that the flange 28 is through to the head of the pile 7 before the foundation 4 is lowered to the head of the piles 7. The basic pillar 25 can be a hollow or closed with all kinds of shapes. The sole 26 can be also a ground based plate or all kinds of ways to do the foundation, for example the pillar 25 can be sit to a stump of the tower 3 in the middle of the steel foot 17/19/21/47//52 in according with figure 10.

Figure 12 presents outsider ground tightening horizontal flange 15 of the pile 7, which is fastened to the pile 7 in the outside and inside to the point, what is going to hit to near to the level of the ground. In the drive pile strikes or drives the raised ground material will be tightening from around and inside of the pile 7 in the last drive pile strikes by to the ground hitting flanges 15. That way the pile 7 is more solid way on the ground. On the flanges 15 can have a vertical position supporting plates. To the end of the drive pile 7 can be fastened horizontal wings 29, which is shaped in the ordinary way so, that they are driving together when the pile 7 is driving to the ground and that way the wings 29 solids the structure and prevents the pulling forces to lift up the piles 7.

Figure 14 presents a rock anchoring of the drive pile 7 without irons and concrete, of course these can be use together with this construction. To the ordinary pile 7 is fastened a ordinary diamond cutting edge 33, which is driving to the rock passing through from the possible ground material. The pile 7 is taking up with its edges 33 and a new another ordinary drive pile 7 is driving back to the rock where already is made the hole.

Figure 16 presents in according with figures 29 and 30 a joint remain hidden wave and current power station 34/35, which consists of in a vertical position being pontoon pipe 41, and inside in the low end of the pipe 41 is the nacelle 53 and the pontoon pipe 41 moves up and down by the power of the waves particularly inside of the tower 3. The tower 3 reaches almost half point of the pontoon pipe 41, and from it the pipe 41 gets support. The current power station 35 can be in according with the basic example explaining a double rotor with that difference, that on the upper point of the tower 3 around the pontoon pipe 41 is a upwards sliding mountings 42 of the current power station 35, in which can get to maintaining with the current power station 35 to the surface level of the sea. The service door 43 is existing in the upper deck of the pipe 41, if the pipe 41 is above the sea surface or if it is under that, when the park is on the ship using or in the coastal near the strand, so the park will remain hidden, then the service air lock 45 to the pipe 41.

Figure 17 presents a ordinary double rotor current power station 35, which are joined together by a horizontal supporting pipe 44, and to the middle of it is fastened in a vertical position the mountings 46, and its assistance the power station 35 can turn on with the direction of the tidal stream. The mountings 46 is lying in a free way inside of the cam of the tower 3. In the mountings 46 can be a hydraulic brake 91 or something like that technique, which is keeping still the horizontal supporting pipe 44. The tower 3 is based to the sea bed in addition to in according with the previous examples of the foundations 4 on the another kind of the ordinary foundations. The service air lock 45 is in the nacelle 53, and from it the maintaining operations can be done by the assistance of the diver. The bigger repairing will be doing by lifting up the whole structure of the power station besides the tower 3 and foundation 4.

Figure 18 presents a pontoon structure triple rotor current power station 35, and from it are in the horizontal position being pressure air and weight load tank supporting arms 47, which are regulating the deepness of the power station 35 and hold still the power station 35 and with them can be lift the power station 35 to the water surface level for service action. In the head of the arms 47 are the nacelles 53 with its rotors 37. The arms 47 from its ends points up in a bevel way, so the nacelles 53 can be above of the water surface when the service doors 45 are open. The power station 35 is based to the sea bed by one pile 7 with its wings 29 and wire winches 22, which are in the crossing point of the arms 47 of the power station 35 in the middle and under of the power station 35, from where the wire 23 goes down and fastens to the hole 24 of the pile 7. The turning head 48 of the pile 7 makes possible the direction changes of the power station 35 with the tidal streams. The swinging current power station 35 can be use on the deep waters.

Figure 20 presents in according with figure 6 in the head of the tripody like foundation 4 and tower 3 is lying and turning on in according with figure 18 a triple rotor current power station 35, which can be use on the shallow waters, wherein the tower like foundation 4 is profitable to use. The services of the nacelles 53 can be done with the service diver by the air locks 45 and the bigger repairing by lifting the rotor arms 47 up to the sea surface with the pressure air and weight load tank technology 97. In according with figure 17 the brake 91 of the mountings 46 keeps still the rotors 37 in the tidal stream direction.

Figure 21 presents in according with figure 8 a pontoon foundation 4 or in according with figure 18 a swinging triple rotor current power station 35, and in the middle of its joining point of the three pontoon pipes 21/47/52 with the pressure air and weight load tank technology 97, is fastened in a vertical position the tower 3 and its around to the upper end in according with figure 27 a double cone wave power station 34. Above of the wave power station 34 of the tower 3 is the service door 43, from where can get to the nacelles 53 of the current power stations 35 by along the tower 3 and pontoon pipes 52. The air wires 49 can be existing in the wire pillar 50, which is fastened to the head of the tower 3. In the head of the tower 3 can be also the wind power station 5, from its tower 3 the air wires 49 continues in that case.

Figure 22 presents a one rotor swinging current power station 35, which is stabiled still by the pressure air and weight load tank technology 97 so, that the both sides of the pontoons 54 of the nacelles 53 are full of air, and that way the power station 35 is pulling the basic sole 58 up and resisting this way the torsional moment of the power station 35, which is directing to the swinging power station 35. With that solution the power station 35 is keeping in balance. The power station 35 is based with two to the side pontoons 54 fastened wire wince 22, wires 23 and one turning wire fastener 57, which is on the concrete block 58 in the bottom of the sea. The service air locks 45 are in the nacelle 53 and hub 55, from there the maintaining will be done by the service diver, repairing by lifting the power station 35 up to water surface. A oblong hub 55 of the two or more blade rotor 37 is air filled, carrying the weight of the rotor 37 and particularly that way is keeping the power station 35 in the horizontal position. To the sea cable 56 has to give a lot of loosen, if the power station 35 turns on 360 degrees with the tidal stream, but also when the power station 35 comes up to the water surface level to the service. The wire fastener 57 is being able to do the turning with the tidal stream. This kind of current power station 35 is meant to be also on the deep waters.

Figure 23 presents a current power station 35 based to the sea bed by the tower 3 and different kind of foundations, which either changes its direction with the tidal stream or the tidal stream comes from the back of the nacelle 53 to the rotor 37 or as it is in the wind power station, there is a separate turning motor 119 in the head of the tower 3 and the tidal stream comes from front of the rotor 37. In the head and inside of the tower 3 is a mountings 68, and its supporting the nacelle 53 turns. To the mountings 68 is fastened a horizontal pipe like wall 66 of the nacelle 53, and its front point is a pipe like hub 74 of the rotor 37, which is fastened by main bearing and stefas 72. In the back section of the vertical wall 66 of the nacelle 53 is a pressure door 63 and the air lock 62 of the service diver, so only in the big repairing the nacelle 53 with its rotors 37 must be lifting up from its lifting handle 60 to the surface of the sea. The lifting handle 60 is fastened to the wall 66 in the roof section of the nacelle 53. In the air lock 62 is a air ventilator 61 of the pressure air tank, and to that can lay down from the sea surface a air tube for increasing the air. In the nacelle 53 is the generator 64 supported to the balks 67, which are fastened to the pipe like wall 66. The generator 64 is axed to the planetary gear 71 by flange joint 59, and between them is the brake 69, which is fastened by pillar to the bottom of the wall 66. The planetary gear 71 is in the point of the main bearing 72 inside on the hub 74 in a vertical position. The shelter wall 70 is front of the gear 71 nacelle's 53 side and between the generator 64 in the wall 66 by bolt fastening with sealing. Behind the gear 71 inside the hub 74 is an another shelter wall 73, which is in the wall of the hub 74 by bolt fastening with sealing. In the shelter walls 70 and 73 can be service doors, which are not drawn, and they allows to let in to the hub 74. Two or more blades 36 of the rotor 37 are fastened with a pipe like part 75 by bolt mountings fastening, bearings and stefas 76 to the fastening frame 77 in the ordinary way of the blade fastening of the wind power station. On the hub 74 is two mountings like bracket for the pipe parts 75 of the blades 36 and to it the bearing and the stefa is joined. Blades 36 are joined to each other inside the hub 74 in this case by a straight pipe 78, which is fastened to the both fastening frame 77 of the blades 36. Around the pipe 78 is a third part rounded teeth wheel 80, where is a turning motor 79 and which is fastened by its fastening frame to the hub 74. This way both blades 36 will be regular by one motor 79. The ankle regulation of the blades 36 regarding to the tidal stream is important, so from the blades 36 can get if needed the power out for the service or device broken, and the brake 69 will be stopping the rotor 37 finally. On the front of the hub 74 is the pressure door 63 and the air ventilator 61 for the service diver. The rotor 37 can be with a big diameter, even 80 – 120 m, so the blades 36 is more solid blade material of the wind power station than usual, wherein can use also Kevlar™ and different kind of composite consisting. The blades 36 is shaped for the water current circumstances in the usual way. The sea cable 56 goes from the nacelle 53 inside the tower 3 to the ground cable and in the cable 56 is loosen for turnings of the power station 35 with the tidal stream and lifting the power station 35 up to the sea surface. The cable 56 cutting by joint piece 60. The electronics 65 is in the nacelle 53 or operative remote control plant.

Figure 24 presents in according with figure 23, but alternative a wind power station like one rotor current power station 35 with that difference, that the pressure case 66 is the size of the generator 64, only a small space for the service man. The questioning is a gearless and brakeless version, and in it has the main bearing 72 replaced by the bearings of the generator 64. Outside of the pressure case 66 are the balks 67 from

around the generator 64 and the balks 67 are continuing to the top of the tower 3 to being as a bench 110 with the shape of the cross, and which is fastened to the top of the direction bearing 122 with the wind power station way. With the direction motor 122 and the brake 69 can the power station 35 be. The mountings 68 is fastened to the bench 110 inside the tower 3. The generator 64 is axed to the hub 74 by a bolt flange joining 59, which is outside of the case 66 and the hub 74. On the case 66 and the hub 74 is the pressure door 63 with the air lock 62 and the air ventilator 61. The rotor 37 can have two or more blades and have a moment and/or double blade in according with figures 42, 43, 44 and 45, wherein the area of the blade 36 is emphasized to the back section of the blade 36.

Figure 26 presents a bigger pack ice circumstances meant one or double cone nacelle 53 of the ice cone wave power station 34. The hydraulic brake 91 or something like that technique, is in the nacelle 53 in the horizontal position in both sides of the tower 25 in the opposite way of each others and they comes out from the insider wall 83 of the power station 34 and is pressing, when they are functioning, the walls of the tower 25 and that way they are preventing the power station 34 sinking under the water surface, when the pack ices are pressing down on the top of the power station 34. The devices of the nacelle 53 are in the same way as they are in the power station 34 of the basic example with that exception, that the wheels 85 are removed and the teeth wheels 86 with its axis 88 are supported by for example carbon fibre, Kevlar™ or other kinds of rubbing pieces 92 and 93. The rubbing piece 93 is fastened to the outside corners of the inner wall 83 to the up and down sections of the power station 34 to the opposite corners of the tower 25 and the rubbing pieces 92 are fastened to the corners of the tower 25, and that way the rubbing pieces 93 and 92 are connecting to each other and in the movement they are rubbing in the corners of the tower 25, which is the shape of the square, and this way they are giving support against the torsional moments of the pack ices. The tower 25 can be any kind of shape and it is made from a stronger joined structure, in other words, from a steel plate and iron concrete or a pre stretched iron concrete, also with the joined structure. The pack ice supporters 92 and 93 can be also like wheels with bearings, in according with the basic example, smooth wheels 85 or other kinds on the corners of the power station 34 and the tower 25. The ice cone wall 81 can be a whole or a half rounded or with any kind of shape and if it is in one part, it's pointing to the up or down in the bevel position, or if it is in two parts, it's pointing to the both directions like it is shown in the picture 27. The generators 64 can be in according with the basic example one or two, then the axes 88 can be two in both sides of the tower 25 or only one axis 88 to an another side of the tower 25, so in that situation the generators 64 will be joining to the same axis 88 with its gear 71. If there are two axes 88 to the both sides of the tower 25, but only one generator 64, then these axes 88 will be joining by one gear 71 and one continuing axis 88 to the generator 64. If there are two generators 64, they can be with different sizes, because on the smaller waves can be function only an another smaller generator 64 and on the bigger waves the bigger generator 64 and on the biggest waves both generators 64. The electronics 65 can existing in the nacelle 53 in the ordinary way or with the centrally way in the operative remote control plant of the mainland, if there are several wave power stations 34 in the park. The service door 43 is in the horizontal position on the upper deck of the nacelle 53, and from the bigger hatches, which are not drawn, is possible to lift devices up and out. The big wave power station 34 hasn't necessarily to be as a pack ice cone. The gear 71 can be any

kind, for example a cone gear 95.

Figure 27 presents a double part wave power station 34, wherein the walls 81 is bevelling for example on the 45 degrees of ankle pointing up and down. This way its lowering the dynamic loads of the wave power station 34, which is functioning as a ice cone. These loads is forming when the pack ices are packing to under the flat floor ice cone or above the flat roof ice cone. The structure makes possible more space under the nacelle 53, which is needed also for pressure air and weight load tank 97, and by it, it can be increase the own weight of the power station 34, when willing for example using both generators 64 and getting the maximum power out with big waves. In the nacelle 53 is a air pipe with its ventilators of the pressure air compressor 96, which is reaching to the outside to the upper deck of the power station 34 and is going near in the wall of the tower 25, which is not drawn. The water filling and outlet hatches or ventilators 98 exists to the lower section of the power station 34 near the wall of the tower 25. This way the pack ices don't harm the devices.

Figure 28 presents a cylinder shaped pack ice free wave power station 34, which functions like above mentioned basic and alternative examples way with that difference, that the pressure air and weight load tank 97 is using now also to preventing in the storms appearing big and sudden waves so, that the wave power station 34 doesn't rise up over the tower 3 or 25 and get broken. In these kind of big and quick height variation circumstances of the waves the big water filling and outlet hatches 98 opens fully open and fills in one time quick its tank 97, so the wave power station 34 sinks quickly under the water. This way do not appear the situation, wherein the high wave could be causing a big force to the wave power station 34 and brake the devices. The size of the nacelle 53, in other words, its amount of the air has to be that kind, which doesn't support anymore the weight of the wave power station 34, instead of that, the power station 34 sinks down if necessary even to the bottom of the sea to the root of the tower 3. In the operative remote control plant is the computer program of the electronics 65 and its antures in the wave power station 34 and in the pile pillars 7, which are more far from the park. The computer follows the weather information and the wave height, this way it can forecast the storms.

Figure 29 presents in according with figure 16 from the water surface a remain hidden nacelle 53 of the wave power station 41. To the wall 99 of the pontoon pipe 41 in the lower section and both sides of the pipe 41 is made a case like wall 100. In the another case 100 of these two cases 100 is existing the teeth wheel 86 directly in crosswise direction position of the wall 99 and the teeth wheel 86 is rounding in the teeth bar 94. The length of the teeth bar 94 is as much as is the height of the tower 3 and the height of the waves, and the bar 94 is in the vertical position wall 101, which is fastened directly in cross direction to the inner wall of the tower 3. The teeth wheel 86 is in the horizontal axis 88, which comes from the nacelle 53 through the case wall 100 with its bearings and stefas 84. The axis 88 joins to the coupling 87, brake 69, planetary or something like that gear 71 and generator 64. Devices can be two or one unit, as in the wave power station 34. Both sides of the pontoon pipe 41 being wall 101 of the tower 3 keeps the pipe 41 in the side position still by to the case walls 100 and 101 fastened rubbing pieces 92 and 93 or by the bearings like wheels or something like that technique, which makes possible the back-ward-and-forward movement of the pipe 41 because of the power of the waves. The construction is that kind, where the teeth wheel 86 can not receive the loads, which causes from the pontoon pipe 41. The ladder 104 comes up from the nacelle 53 and continuing up to the service door 43 or

the air lock 45. In the pipe 41 above the nacelle 53 is around the service ladder space 102 a pressure air and weight load tank 97, which is functioning in the before mentioned examples way with that difference, that the water filling hatches 98 is existing in the side of the pipe 41 above of the tower 3 and the water out let hatches 98 with its pipes goes from the tank 97 forward through the nacelle 53 and the bottom floor of the pipe 41 to the inside of the tower 3. The floor 103 is a removable model, so when lifting the pipe 41 off from the tower 3 to the dock, the repairing can do to the devices by lifting the pipe 41 off from the above of the nacelle 53. The electronics 65 can existing in the nacelle 53 or operative remote control plant.

Figure 36 presents in according with figure 32 an alternative nacelle of the wind power station 5, where the gear 71 is modulated out from the point of the main bearing 112 to a changed part.

Figure 37 presents in according with the basic example explaining the alternative of the wind power station's 5 nacelle 53 and its double blade rotor 37 hub 114, in which the shelter case 108 is done smaller to the around of the generator 64, and the gear 71, brake 69, balk 111, main bearing 112, shelter case 70, service door 115 and shelter cone 103 is removed. Outside of the shelter case 108, which follows the shapes of the generator 64, is existing the balks 67 in according with the basic example, but now in the bench 110 of the shape of the cross. In the shelter case 108 to the both ends of the generator 64 are big service doors 116. The service flat floor ridge 109 with its railings is surrounding the generator 64. The upper hole of the tower 3 is plated to expire from the above of the direction bearing 122 and there is a service door 116, which is not drawn. The bearings of the generator 64 functions like the main bearing and the hub 114 will be joining by bolt flange joining 59 to the axis of the generator 64. The blade ankles of the blades 124 of the rotor 37 will be regulating by one regulator motor 79, which functions also as a air brake in the ordinary way so, that the brake 69 no needed. The hub 114 is shaped to a rectangular for two blades 124 so, that inside of the hub 114 the blades 124 will be joining to each other by bolt mountings frames 118 and the pipe 78, where is the third part rounded teeth wheel 80 of the regulator motor 79, quite as it is in the figures 23 and 24 current power station example. On the pipe 78 is a hole for the blade air warming, so from the warm air blower 117 the air flow gets through the pipe 78 to the rounding air of the blades 124. In the outsider head of the hub 114 is the service door 116. Inside of the tower 3 being ladder 121 can be replace by a service elevator, which is not drawn, and with that the smaller device transporting can do. When the height of the tower 3 reaches even 120 m, the service man needs itself the elevator. The blades 124 of the rotor 37 can be more than two.

Figure 39 presents the same kind of type where is the lightened blade profile as in the figure 38 of the basic example explaining, wherein with the structure plate 127 is looked for by the shape of the U-balk the stiffness. Now the structure plate 127 is removed and from the root of the hub 114 the pipe 129 continues with the joined construction for example like the pipe balk of the shape of the square to the end of the blade 124. To the balk 129 is fastened to the up- and downsides with the ordinary way together glued shelter case parts 128, which gives to the blade 124 for example the shape of the NACA-blade profile. The pipe 129 functions as a air warming rounding channel.

Figure 41 presents an alternative blade 124 of the wind power station 5, where are two upper side, for example in according with the NACA-blade profile, a same profiler,

curved and overlapped structure plate 127 with the noticeable air chink for the undisturbed wind flowing, which goes through in both structure plates 127 certainly, and where are cross upright walls 130 between the structure plates 127 with the regular distances and amount of the deepness of the structure plates 127. In these upright walls 130 on the up and down surfaces are the horizontal plates 131, which are glue fastened or something else way to the structure plates 127, and these plates 131 are either on the both sides of the upright wall 130 or only on the other side of the upright wall 130. The structure plates 127 are joining to each other by the horizontal plates 131 to a stiff structure. To the hub 114 is fastening the fastening pipe 129 of the double blade, which is fastened to the side of the first upright wall 130 or all kinds of different ways. In the warming of the blades 124 must use the warm wire elements. The alternative way are in the down side being light structure shelter cases 128, which gives for example the whole shape of the NACA-blade profile or it can use for example a carbon fibre and PVC-film, so then the air warming can be use. The structure plates 127 can be instead of two, also three or four with overlapped way.
Figures 43, 44 and 45 presents the alternative blades 36 of the current power station 35, where are improved the moment for the slow tidal streams. In the current power stations don't exists the turbulence like in the wind power stations and the length of the blades are remarkable shorter than in the wind power stations, so there are no a structural obstacle to increase the surface area of the blade 36 to the end up of the blades 36. The blades 36 consisting with the way of the wind power station 5 from the fastening pipe 129 of the hub 74, where in the way of the wind power station immediately from the beginning of the pipe 129 the broadening structure part 127 continues in the same broad or broadens more from the different point of the structure part 127 towards to the end up of the blades 36. The broadening shape in the structure part 127 can be directly from the up watched the shape of a bucket, triangle, square, rectangle or every kind of shape. The structure part 127 is directly from its end watched to the water power station use meant a traditional shape of the curved winger of the turbine. From the pipe 129 and under of the structure plate 127 goes an another opposite structure plate 128, which is glued to the upper structure plate 127 with the traditional way of the blade of the wind power station, but in this case the structure plate 128 ends about a third part of the length of the blade 36, so the structure plate 127 continues alone to the end of the blade 36. Meaning of the structure plate 128 is to give a support to the upper structure plate 127. On the sea current circumstances the hydrostatic and dynamic forces makes possible by using also a structure of one plate of the wingers, as long as the blade 36 is supported from its root enough.
Figure 46 presents in according with figures 43, 44 and 45 an alternative structure of the blade 36 of the current power station 35, in according with the wind power station 5 the structure of the double blade 124 is modified to the current circumstances of the tidal streams, in other words, to the before mentioned shape of the curved winger of the turbine. The pipe part 129 can be joining to the two structure plates 127 in according with the double blade 124 of the wind power station 5 or as it in the figure 44, each structure plate 127 is equipped with on the lower side structure plate 128 supporter or with the any kind of way. The structure plates 127 can be instead of two, three or four with the overlapping way and with the different shape of to giving the moment.

In according with the presented wind, wave and current power stations 5/34/35 can be also gearless equipped with the multi hub generators 64 and frequency changers, batteries 90 and also fuel shells.

The wind power station 5 can be brakeless by the blade ankle and active stalling regulation blades 124, so the gear 71 can be between the main bearing 112 and generator 64 in inside the hub 114. The ridge 109 of the wind power station 5 can be also a closed floor. The generators 64 and gears 71 too of the wave power stations 34/41 and current power stations 35 can be with the water cooling. The rounding speed of the generator 64 of the wave power station 34/41 should keep as big as possible, for example 1500 rounding per minute, because this way the big sensitivity as possible will be get to the movement of the wave power station 34/41. In the wave power stations 34/41 can be different amount of supporting wheels 85 either in the independent way axed to the wall 83 and/or axed to the another supporting structure and/or the supporting wheels 85 can be in the axis 88 in the different places against the tower 3 and/or any kind of other ways. The material of the rubbing pieces 92/93 has to be less friction causing as possible, in other words, with a smooth surface, taking to consideration the qualities of firmness, structure and durability, so that the wave power station 34/41 can move undisturbed way as possible in the tower 3. The material can also be the mixture of steel and brass or something like that. The battery 90 of the wave power station 34/41, which can existing in the down section of the tower 3 or in the nacelle 53, and it can remove if necessary because of the voltage doesn't go to zero. The wave power station 34 can be like the pontoon version of the remain hidden wave power station 41, which is inside the perforated tower 3 of the wind power station 5 and is moving on the tower 3. In the remain hidden wave power station 41 can be also a hydraulic or something like that brake 91 for stopping to the tower 3 to the wanted height. The remain hidden wave power station 41 can function also as a pack ice cone for example with the shape of one or two part cone or cylinder, but also without the pack ice cone the head of the pipe 41 can be the shape of any kind for getting the optimal efficiency as possible in the fast height variations of the waves. The wave power station 34 can function so, that when the wave power station 34 be as a ice cone, the wave power station 34 can be for example in a half or almost in a whole way above of the water surface, also equipped with the pressure air and weight load tank 97, which can even continuing for example to the deep with the shape of the cylinder. Without the pack ice cone functioning for example a small part of the wave power station 34 can be under the sea surface, so that the optimal raise and efficiency can get. The wave power station 34/41 can be very well under the sea sur-face, so the maintaining from the air service lock 45 by the diver can be done or with the pressure air and weight load tank 97 the wave power station 34/41 is raising up to the sea surface for service, and that time it can use the service door 43. The pressure air and weight load tank 97 can always be in the wave power station 34/41 and it can functioning always also to increasing the extra weight, so that the wave power station 34/41 will be come downwards certainly on the most lower points of the waves, when the generators 64 are refusing the downwards coming. In this case the measurement of the air section space of the nacelle 53 and the pressure air and weight load tank 97 has to be that kind, that with the water weight the wave power station 34/41 is mainly above the sea surface for getting the optimal raise in according with figure 28. The best efficiency, in other words, how fast the wave power station 34/41 is reacting to the movements of the wave periods and is that movement as big as it is in the height

of the wave. So this way can be able to benefits the kinetic energy of the whole wave potential, depending on of course dimensioning of the generators 64, own weight of the wave power station 34/41, water weight of the weight load tank 97 and amount of air of the nacelle 53 and the pressure air tank 97, but also from that how wide is the bottom area where the wave power station 34/41 swings above the sea surface. This area always have to try to keep as big as possible observing a wave spectrum of each production place and the durability of the construction, and that way can get as big sensitivity as possible on significant wave heights. The bottom of the wave power station 34/41 should be design to convex in according with the wave spectrum. In the wave power station 34/41, because of the storms causing or in variations of quick wind directions, on cross waves et cetera, that kind of un-typical formation of the waves, which are causing too big continuing waves or quick height variations of the waves, can always use also the pressure air and weight load tank 97 with its big water filling and out let hatches and/or ventilators 98 and these hatches or ventilators 98 of different size can be existing in any section of the tank 97 or it can use any different kind of method to sink the wave power station 34/41 under the sea surface and to lift it back. It can also work up to this use a modified electronics 65 and to it belonging a computer soft with its wave height and force antures to any kind of form, so for example when the soft program reads the general weather information, it can take to consideration and forecasting the coming storms, which will be causing too big height variations and forces of the waves, but if the program in some reason have no time to react and let down the wave power station 34/41 to under the sea surface, the hydraulic or something like that brake 91 has to act and lock the wave power station 34/41 to its place to the tower 3 and/or the coupling 87 have to open automatically and remove the load of the generator 64 or any kinds of ways to loose the loads. The waves can vary from the theoretical blue forming model to almost like any kind of untypical forming of the wave, so it might be appear almost sheer drops of the walls of the waves, and its current effects might be reaching to deep under the sea surface and this way it can direct big and temporary dynamic loads to the wave power station 34/41. In that case is important, that the wave power station 34/41 for example doesn't fall downwards in a moment in the tower 3 and broke for example the teeth and roller wheels 86/85. In that kind circumstances the sensitivity has to remove from the wave power station 34/41 by forecasting the wave measurement and using the program 65 also with the way, where are far and near the wave measurement places enough at regular apart. In the too big height of the waves under to the medium water surface reaching dynamic forces of the wave flows are easier to control, when the wave power station 34/41 is under the water surface and the pressure air and weight load tank 97 is full of water, that way the wave power station 34/41 doesn't function anymore like a pontoon with full of air, but instead of that, it is insensitive and is a same construction with the tower 3 and moves a little bit up and down in the tower 3 with the water flows. In that case, if the foundation 4 is very near to the wave power station 34/41, the hydraulic brake 91 can lock the wave power station 34/41 to its place. If for example the wave power station 34/41 is a very high cylinder, the rubbing pieces 93 has to be in the wall 83 even from the height of the wave power station 34. The pressure air and weight load tank 97 can divide to several parts by intermediary walls, which are not drawn, because of constructional reasons and/or more uniform weight distribution. The air tube of the pressure air compressor 96 can be in the reel and reaching from the deck of the wave power station 34/41 to up high for example in the

side pipe of the tower 3, so that supply of the air can come possible when the wave power station 34/41 sinks to deep even to the root of the tower 3. It can also use if necessary one or more separate pressure air tank. In the wave power station 34 can be more than one tower 3 on the different points of the power station 34 or the nacelle 53 or other that kind of construction. The teeth and wheel bar 82 or smooth wheel bar 89 or mere teeth bar 94 can be in the tower 3 with fixed way with respect to the vertical position direction, but in the horizontal direction these bars 82/89/94 can rolling around the tower 3, and that way the wave power station 34 can rolling around the tower 3 for lowering loads of the pack ices. The bars 82/ 89/94 can be in this case equip from its up and down ends with the frame, which is fastened to the groove, which are in up and down heads of the tower 3, so the bars 82/89/94 slides like a loose way in the horizontal plane around the tower 3. In according with figure 23 and 24 the one rotor current power station 35 can be based by drilling a big pile 7, which is forming from the tower 3, and its wings 29, straight to the sea bed, and then the head of the tower 3 can be lowering to the nacelle 53 with its rotors 37. To the electronics 65 belonging a frequency changer can be existing in the centrally way in the wind-, wave- and current power stations 5/34/41/35 in the operative remote control plant of the mainland. The alternative of the tower 3 can be a tower or pillar 25, which can also reach up always to the nacelle 53 of the wind power station 5. In the wind and wave power station 5/34 is recommending and should use for absorbing vibrations of the tower 3, the concrete pillar 25 from the point of the foundation 4 to upwards in the section of the wave power station 34, and not until from there the steel tower 3 of the wind power station 5 would be starting. This very important especially in the areas of the pack ices, where the pack ice cone wave power station 34 is dimensioning to the heavy weights for the 100 tons of static loads, so when the power station 34 is moving on the tower 25 the power station 34 causes to the tower 3 of the wind power station 5 an extra load, which is appearing in extra vibrations on the whole section of the tower 25/3. The erosion plates 20 can use also all different kinds of ground based foundations, also in mainland. To the alternative of the air ship 1 can also use a air, in other words, a gas balloon, which will be steering for example from the barge 12. The air ship 1 can transport parts of the power station also without the scaffold 2 by mere wires and scars/conveyers or with any kinds of other ways. In the pontoon frame 9 can be a cockpit and a full terrace grating 109 for the operating of the setting motors, although the pontoon frame 9 usually will be steering by the remote control from the barge 12. The pontoon frame 9 can by the pressure air and weight load tank 97, lower down also to the bottom of the sea bed, when it is lowering the foundation 4, if in the transporting is for example a high and wide wave power station 34, which have to be above of the fastening collar 11 in high point of the tower 3. Figure's 38 the pipe balk 129 of the blade 124 can be made besides by glass and carbon fibre, for example from the steel, and that way the air warming is functioning better with the material which is storing the heat. The problem on the air warming has been that kind, that in the ordinary construction thickness the well heat insulator glass fibre doesn't conduct the heat to the outer surface of the blade and the air doesn't conduct well the heat. In the light construction parts 128 this kind of problem do not existing. Besides the pipe balk 129 is directing the warm air at first to the end of the blade 124, and from there the air rounding to the shelter case parts 128 and ends up back to the hub 114 by the air holes which are in the front ends of the pipes 129. The shelter case parts 128 can be also a storing material, for example a sheet metal, aluminium, or every kind of different

material sorts and their different mixture proportions. Figure's 37 in according with the basic example explaining the U-balk shape of the construction plate 127 of the blade 124 can well be to the front side of the blade 124, in other words, to the lead edge, because the icing happens mostly in the vacuum areas in back sections of the blades. The wind-, wave- and current power stations 5/34/41/35 can be besides as in the joint power stations like, but as their own separate power stations like in the same or different parks, and these kind of power stations can be also in all other kinds than what is showed in this application.

Figures and to them joining explanation is meant only to illustrate out being inventions. From its details the wind-, wave- and current power stations with its foundations can be vary about its size, shape, construction, function, material sorts and proportions, as well as about its different manufacturing, transporting and installing methods, with the attached patent claims what is shown in the settings of the inventiveness thoughts. To the man of the field is also a self clear, that in the level of the present technology used the different material sorts and their proportions, can also make possible new kinds of sorts and proportions, as well as the outsider materials of the field, so the before mentioned material sorts are only a part of them what kinds of the questioning being inventions are possible to manufacture.

Patent claims:

1. To the production of the electricity and fuel cell meant wind-, wave- and current power stations, k n o w n from it, that the type of two or three joined power stations are in the same tower and foundation and the one type power station that way, that the joined power stations are in the production park with the amounted intermediates and the separate power stations are between and outside of the joined power stations.

2. In according with the patent claim 1 to the production of the electricity and fuel sell meant wind-, wave- and current power station, k n o w n from it, that to the head of the tower (3) of the wind power station (5) is fastened a T-shaped pipe balk bench (110), and to its front head is fastened a rounded frame balk (112), and its inside is fastened a pipe like mountings (114), which functions like a hub and main bearing. Inside of the mountings (114) to the back section is fastened a planetary or another that kind of gear (71), and its front side is a service door (115) and in back side a shelter case (70). A generator (64) is axed to the gear (71) by a bolt flange joining (59), and between them is a brake disk of the brake (69). The brake (69) is fastened to the bench (110) to between the generator (64) and the gear (71) that way, that a service space is existing. To a bolt mountings frames (118) of the hub (114) are fastened less than a one round teeth wheel (126). To a turning motors (123) are a reserve system battery (90). Electronics (65) are in a operative remote control plant or on the down section of the tower (3).

3. In according with the patent claim 1 to the production of the electricity and fuel cell meant wind-, wave- and current power stations, k n o w n from it, that in a alternative nacelle (53) of the wind power station (5) is a shelter case (108), which is around the generator (64) and the gear (71), brake (91), balk (111), main bearing (112), shelter case (70), service door (115) and shelter cone (113) are removed. In the outside of the shelter case (108) existing the balks (67) of the generator (64) are for example in a bench (110) which is a shape of a cross. In the shelter case (108) is in the both ends of the generator (64) big service doors (116). A service terrace (109) with its railings rounding the generator (64) and shelter case (108). Like in a main bearing (112) functions the bearings of the generator (64) and the hub (114) will be joining by bolt flange joining (59) to the axis of the generator (64). If a rotor (37) is with a double blade (124), blade ankles will be regulating by a one regulator motor (79). It can use the traditionally air brake so, that the brake (69) do not need. The hub (114) is shaped to a form of a rectangle for the two blades (124) so, that inside the hub (114) the blades (124) will be joining to each other by the bolt mountings frames (118) and a pipe (78), wherein are less than a round teeth wheel (80) of the turning motor (79). On the pipe (78) are holes for a blade air warming. For example to a outsider end of the hub (114) is the service door (116).

4. In according with the patent claims 1, 2 or 3 to the production of the electricity and fuel cell meant wind-, wave- and current power stations, k n o w n from it, that a blade (124) of the wind power station consists of a fastening pipe (129), which continues in the lead edge section with a const-ruction plate (127) of like a U-balk,

and to it in a leaving edge section a shelter case (129) is fastened giving to the blade (124) for example a shape of a NACA-blade profile.

5. In according with the patent claims 1, 2 or 3 to the production of the electricity and fuel cell meant wind-, wave- and current power stations, k n o w n from it, that an alternative blade (124) of the wind power station (5) can also be with two, three or four parts, where from the pipe balk (129) with the shape of the upper side of the blade (124) goes two, three or four construction parts (127), which are fastened with a overlapping way by a vertical supporters (130) that way, that between of the construction plates (127) is leaved sufficient air chinks for getting a undisturbed air flow and from the vertical supporters (130) goes as like in a same construction horizontal supporters (131), which are fastened in a amount intermediate way to down and upper surfaces of the construction plates (127).

6. In according with the patent claims 1, 2, 3 or 4 to the production of the electricity and fuel cell meant wind-, wave- and current power stations, k n o w n from it, that in a air warming of a ice preventing of the blade of the wind power station, the blade (124) consists from the fastening pipe (129) and shelter case parts (128), which are very a heat storing material.

7. In according with the patent claim 1 to the production of the electricity and fuel cell meant wind-, wave- and current power stations, k n o w n from it, that a pontoon like wave power station (34) is supported to a tower (3/25) by one or more wheel and teeth bar (82) and/or teeth bar (94) and/or wheel bar (89) and/or rubbing pieces (92) and (93). To a side of a nacelle (53) going horizontal axes (88) can be with two wheels (85) on both sides of a teeth wheel (86) and on other axes (88) for example one smooth surface wheel (85). One or more axis (88) can be joined to the planetary or other that kind of gear (71). In the nacelle (53) or the tower (3/25) can be a battery (90). The electronics (65) can be with a centrally way in a operative remote control plant of the park in the main-land. The wave power station (34) can be like up or down to one direction bevelling cone of its shape or to both directions bevelling a double part cone of its shape, having two or more layers and can functioning also like a pack ice cone (16/13), but a bottom has always has to be in according with a big area and wave spectrum. The wave power station (34) can be equipped with a pressure air and weight load tank technology (97) and/or with several generators (64), for example that way, that on the smaller waves functions a smaller generator (64) with its empty weight load tank (97) and on the bigger waves functions a bigger generator (64) or both with the full weight load tank (97). The pressure air and weight load tank technology (97) functions also for preventing the big dynamic forces in big height variations of the waves and in the big waves, which the storms causing, by equipped its computer program (65) and water filling and out let hatches and/or ventilators (98), which sinks the power station (34) under the water even to a root of the tower (3/25). And when the storm is quietening down the power station (34) comes up to the surface of the sea. To the electronics (65) belonging a computer program observing also the weather circumstances from the general weather services and measuring with its antures the heights and forces of the waves from the wave power station (34) and/or separate in far being measurement points, and forecasting situations and

preventing the wave power station (34) going up over from the tower (3). In the pressure air and weight load tank (97) can be also intermediate walls. A compressor (96) can be equipped with one or more separate pressure air tanks. In the nacelle (53) on walls (83) in both sides and against the tower (3/25) can be existing in a horizontal position and against of each other two or more hydraulic functioning or other that kind of ways the brakes (91), which by the computer program (65) pressing against to the tower (3/25) and this way stopping the wave power station (34) to the crest of the wave, and to maintaining actions or when a device broken happens. In the pack ice using the brake (91) keeps the wave power station (34) in the surface of the water, when the pack ices presses the wave power station (34) down.

8. In according with the patent claims 1 or 7 to the production of the electricity and fuel cell meant wind-, wave- and current power stations, k n o w n from it, that in a alternative wave power station is from the sea surface a remain hidden pontoon pipe model (41), which is fastened to moving inside on the tower (3) to a upper part so, that a upper part of the pontoon pipe (41) is outside of the tower (3).

9. In according with the patent claim 1 to the production of the electricity and fuel cell meant wind-, wave- and current power stations, k n o w n from it, that in a head and inside of the tower (3) of the current power station (35) is with the tidal stream turning a mountings (68), where is a direction motor (119), direction bearing (122) and teeth wheel frame (120). To the mountings (68) is fastened a horizontal pipe like wall (66) of a nacelle (53), and to its front side a pipe like hub (74) of a rotor (37). In the nacelle (53) is for a maintaining diver a pressure door (63) and a air lock (62). On the air lock (62) is a air ventilator of a pressure air tank (61) for a incoming air tube from the sea surface. A generator (64) is axed to a planetary or other that kind of a gear (71) by a bolt flange joining (59), and between them is a brake disk of a brake (69). The gear (71) is in the point of a main bearing (72) on the hub (74). Blades (36) are joined to each other inside the hub (74) by pipe (78), which is fastened to a fastening frame (77) of the blades (36). To around the pipe (78) is fastened less than a round teeth wheel (80), wherein is a turning motor (79). On the hub (74) in the front point can be the pressure door (63), air lock (62) and air ventilator (61). Electronics (65) can be in the current power station park in a operative remote control plant in a centrally way.

10. In according with the patent claim 1 to the production of the electricity and fuel cell meant wind-, wave- and current power stations, k n o w n from it, that an alternative current power station (35) is without a gear, main bearing, brake and a pressure case (66) follows a generator (64) leaving scantily a maintaining space to around the generator (64), and a hub (74) of two or more blade (36) of a rotor (37) is with its own unit. In the pressure case (66) and the hub (74) are pressure doors (63) with its air locks (62) and air ventilators (61). The generator (64) and the hub (74) will be joining to each other by a bolt flange joining (59) of a axis of the generator (64). Bearings of the generator (64) are functioning like a main bearing (72). A bench (110) can be equipped with a direction bearing (122) and a direction motor (119) and its teeth wheel frame (120) for example in the head of a tower (3).

11. In according with the patent claims 1, 9 or 10 to the production of the electricity and the fuel cell meant wind-, wave- and current power stations, k n o w n from it, that in a two or three type joint power station is on a tower (3/25) a double rotor (37), to upwards bevelling supporting arms (38) with a pressure air and weight load tank technology (97), a mountings (38), where is a hydraulic or other that kind of a brake (91) and a flange (40), and they forming to the tower (3/25) supporting a current power station (35), which can rise to the maintaining by the pressure air and weight load tank technology (97) so, that nacelles (53) with service doors (43) are above the sea surface, and consistent with the current power station (35) can lower down by the same technology (97) back to its production place.

12. In according with the patent claims 1, 9 or 10 to the production of the electricity and fuel cell meant wind-, wave- and current power stations, k n o w n from it, that with a pressure air and weight load tank technology (97) equipped a current power station (35), where are three from its heads upwards bevelling pontoon pipes (47) and rotors (37), are meant to the production places of deep waters and is based to the bottom of the sea for example by one or more wire wince (22), wire (23), pile (7) and its direction joining (48) and horizontal wings (29) so, that the current power station (35) can raise up to the maintaining by its pressure air and weight load tank technology (97) so, that nacelles (53) and service doors (43) can be above the sea surface, and consistent with the current power station (35) can lower down with the same technology (97) back to its production place.

13. In according with the patent claims 1, 9 or 10 to the production of the electricity and fuel cell meant wind-, wave- and current power stations, k n o w n from it, that with the tidal stream directing two or three rotors (37) with pontoon pipes (47), mountings (46) and hydraulic or other that kind of brakes (91) equipped a current power station (35), is meant to the production places of shallow waters and is based to the bottom of the sea by different types of foundations (4) so, that the current power station (35) lying to a head of a tower (3) and can be maintaining in its production place by a maintaining diver through service air locks (45).

14. In according with the patent claims 1, 9, 10, 11, 12 or 13 to the production of the electricity and fuel cell meant wind-, wave- and current power stations, k n o w n from it, that a blade (36) of a current power station (35) consisting from a fastening pipe (129), and immediately from the beginning of the pipe (129) a broadening structure part (127) continues in the same broad or broadens more from the different point of the structure part (127) towards to an end up of a blade for getting a maximum moment, and the structure part (127) is shaped for example a curved form directly from its end watched for getting a maximum efficiency. From the pipe (129) under the structure plate (127) can go an another opposite structure plate (128), which is fastened to the upper structure plate (127). The structure plate (128) can also end about a third part of the length of the blade (36), so the above being structure plate (127) can continue alone to the end of the blade (36).

15. In according with the patent claims 1, 9, 10, 11, 12 or 13 to the production of the electricity and fuel cell meant wind-, wave- and current power stations, k n o w n from it, that an alternative blade (36) of a current power station (35) can be also in according with a structure of a double blade (124) and can be modified to the current circumstances of the tidal streams that way, that a pipe part (129) can joining to two, three or four similar overlapping structure plates (127), which are fastened to each other by vertical supporters (130) and horizontal plates (131). Besides that construction can be supported by a structure plate (128), which is on the lower side and the each structure plate (127) is equipped with, or the construction can be supported by the structure plate (128) only from the front point of the blade (36).

16. In according with the patent claim 1 to the production of the electricity and fuel cell meant wind-, wave- and current power stations, k n o w n from it, that with two or three type joint power stations and separate power stations, a tower (3) reaches with a joined construction to under the sea surface quite to the surface of the ground, and to the side on the down section of the tower (3) are fastened different kinds of foundations (4), as pile hats (14) or horizontal feet (17) with piles (7), ground based horizontal feet (19) with erosion plates (20), pontoon feet (21) with pressure air and weight load tank technology (97) and with wire winces (22), wires (23), piles (7) and its wings (29) so, that from the tower (3) and foundation constructions (4) will be forming a joint tower foundation (3/4), and then to the down section of the tower (3) will be always leaving enough space for fastening, using and maintaining the several power station types, and the tower foundation (3/4) makes possible to transporting and installing the ready power stations with the joint construction way.

17. In according with the patent claims 1 or 16 to the production of the electricity and fuel cell meant wind-, wave- and current power stations, k n o w n from it, that with two or three type joint power stations and separate wave power station (34), can use on a functioning point of the wave power station (34) for absorbing vibrations, a steel concrete, joint construction or pre stretched steel concrete basic pillar (25), and to it is fastened different kinds of foundation constructions (4), as a concrete sole (26) or a short steel tower (3) with feet (17), pile hats (14) and piles (7). When the wind power station is along with the joint power station, from above of the basic pillar (25) continues the tower (3) with the joined construction way up to the wind power station.

18. In according with the patent claims 1, 16 or 17 to the production of the electricity and fuel cell meant wind-, wave- and current power stations, k n o w n from it, that in a rock anchoring of drive piles is to a drive pile (7) fastening and removing a diamond cutting edge (33), which drills to the rock a hole and this way anchoring the ordinary pile (7) to the rock.

19. In according with the patent claims 1, 16 or 17 to the production of the electricity and fuel cell meant wind-, wave- and current power stations, k n o w n from it, that with two or three type joint power stations and separate power stations will be joining to each other by air wires (49) and by a wind power station (5) and/or a

wave power station (34) and/or a air wire pillar (7/50) to one production park unity.

20. In according with the patent claims 1, 16 or 17 to the production of the electricity and fuel cell meant wind-, wave- and current power stations, k n o w n from it, that on a tower (3/25) and air wire pillar (7/50) are a double part to both directions bevelling pack ice cone (13).

21. In according with the patent claims 1, 16 or 17 to the production of the electricity and fuel cell meant wind-, wave- and current power stations, k n o w n from it, that on a tower (3/25) is in upper than usual existing a service door (43) and under that to the tower (3/25) fastened a remote control, fold up and extension ladder (114) for making sure to passing over of the pack ice heaps in all kind of weather circumstances.

22. To the production of the electricity and fuel cell meant wind-, wave- and current power stations and their method for manufacturing, transporting and installing, k n o w n from it, that two or three type joint power stations in a same tower and foundation and one type wave or current power stations will be assembling in a factory or doc to ready joint and separate power stations, will be transporting with a joined construction way to a production park and will be installing directly to a ground so, that the joint power stations are in the production park with a regular distances and the separate power stations are between and outside of the joint power stations.

23. In according with the patent claim 22 the transporting and installing method of the wind-, wave- and current power stations, k n o w n from it, that joint and separate power stations, foundations and towers can be transport and install by to this use being suitable air ships (1), for example with a lifting frames (6), which are equipped with usual tackles and wires.

24. In according with the patent claim 22 the transporting and installing method of the wind-, wave- and current power stations, k n o w n from it, that in a alternative transport and install method can use to this use being suitable by a barge (12) pulling or by itself moving a deep pontoon frame (9), where is fastening frames (11) and hydraulic or other kind of pressers (10).

25. In according with the patent claim 22 the transporting method of the wind-, wave- and current power stations, k n o w n from it, that to this use being suitable air ships (1) can transport parts of joint and separate power stations using for example a scaffold (2).

26. In according with the patent claim 22 the transporting and installing method of the wind-, wave- and current power stations, k n o w n from it, that for transporting and ramming or drilling of piles meant a deep pontoon ship (8), which transports, installs, irons, concretes and anchors piles to a rock.

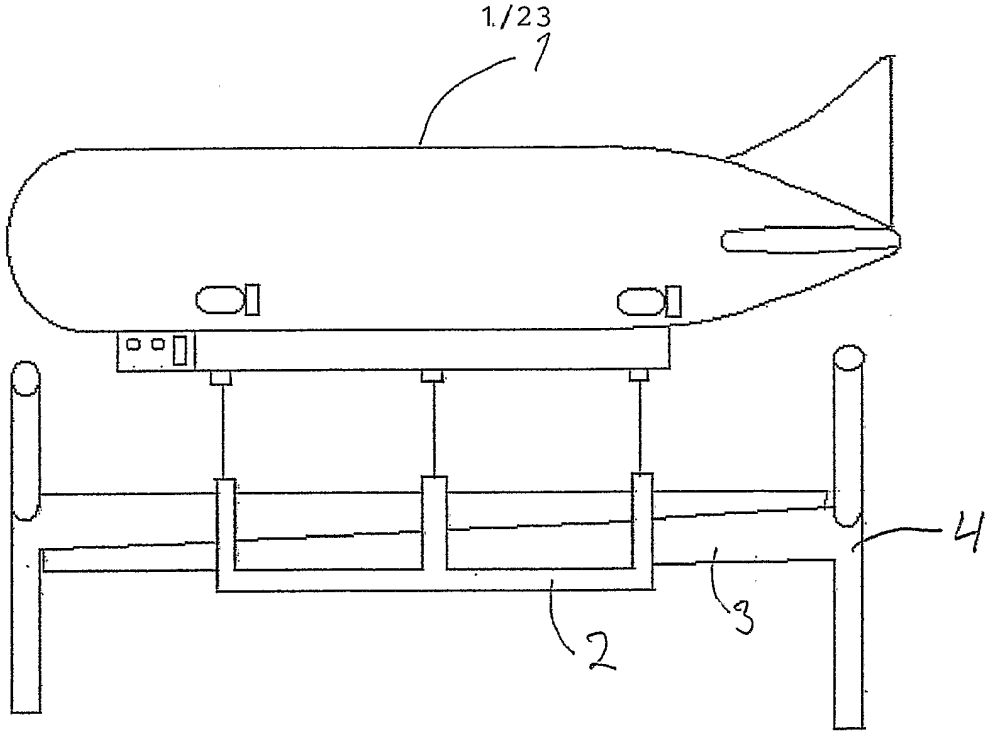


Fig. 1

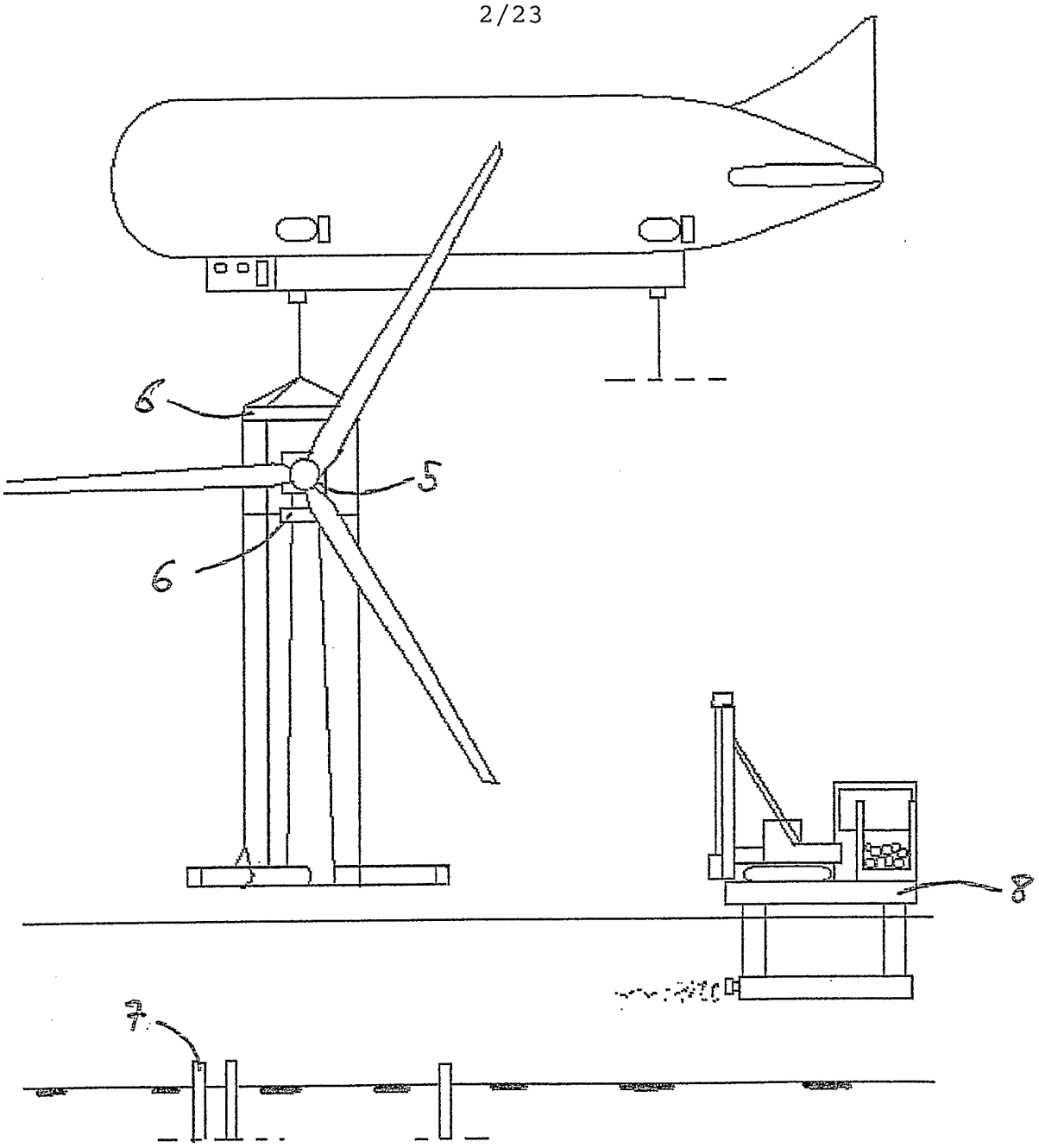


Fig. 2

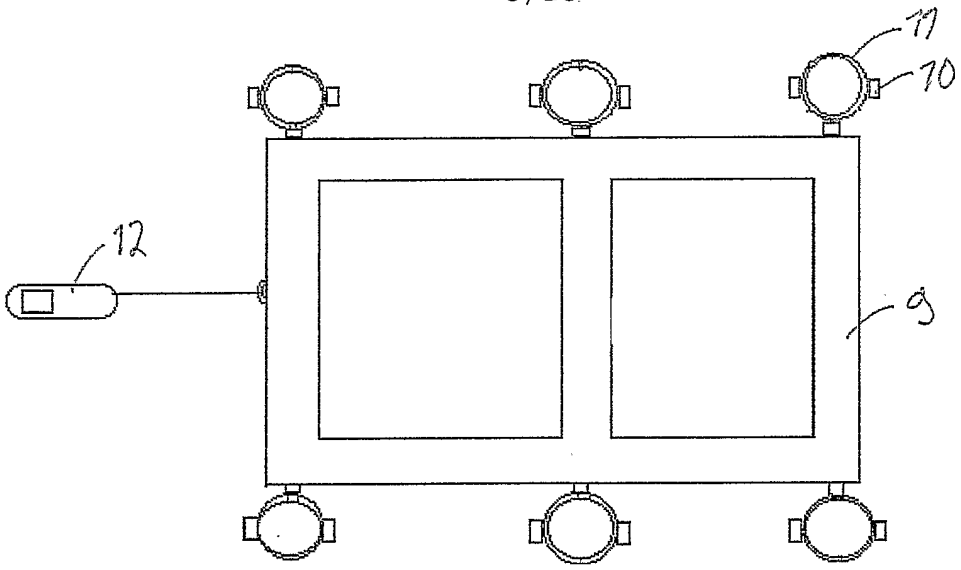


Fig. 3

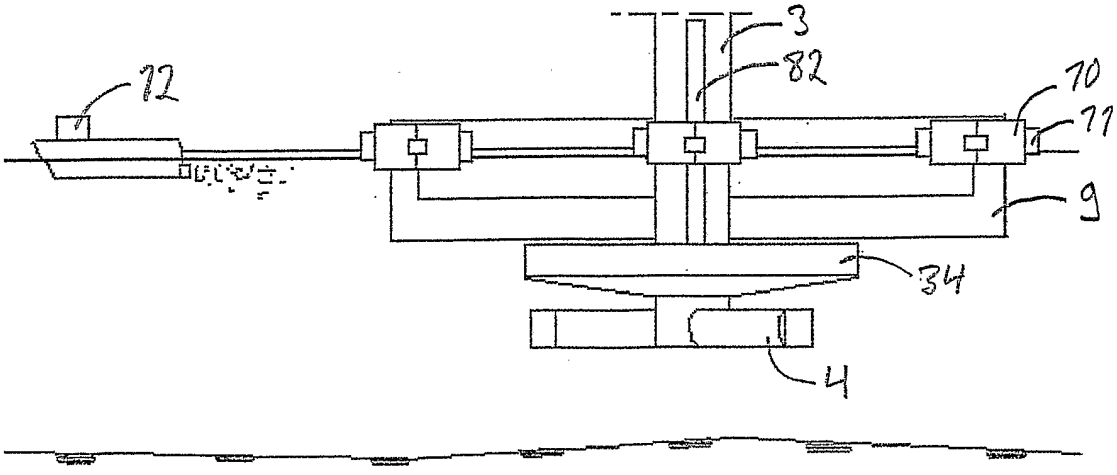


Fig. 4

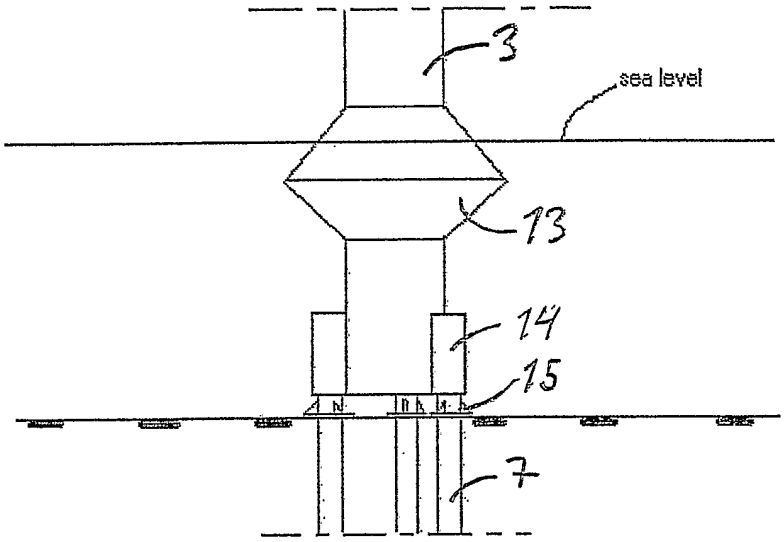


Fig.5

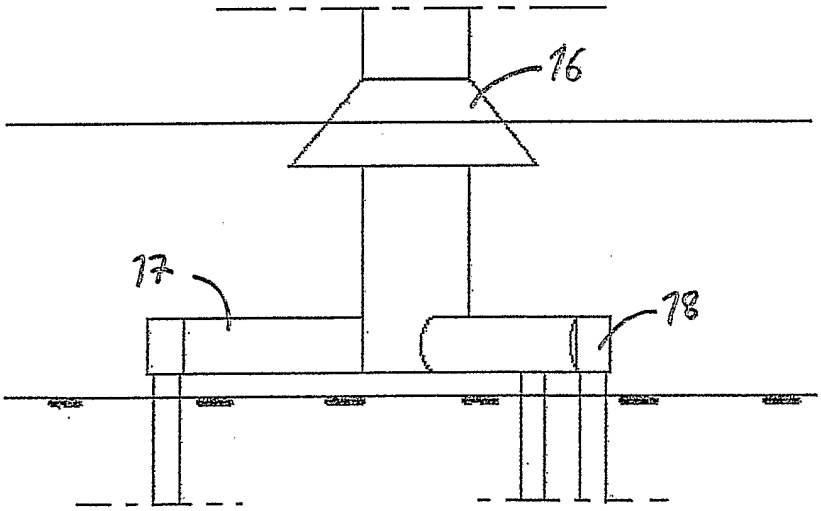
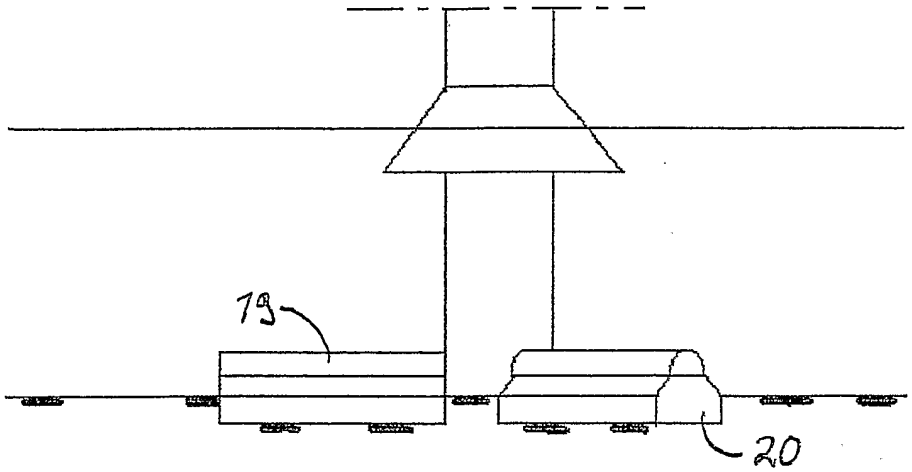


Fig.6

Fig. 7



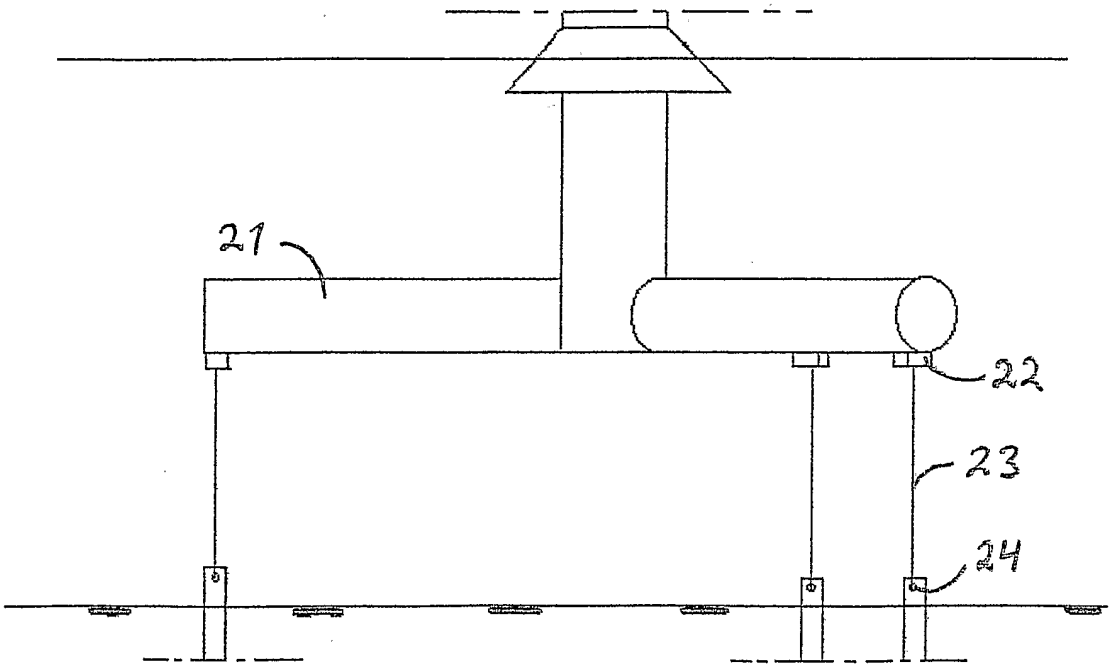


Fig. 8

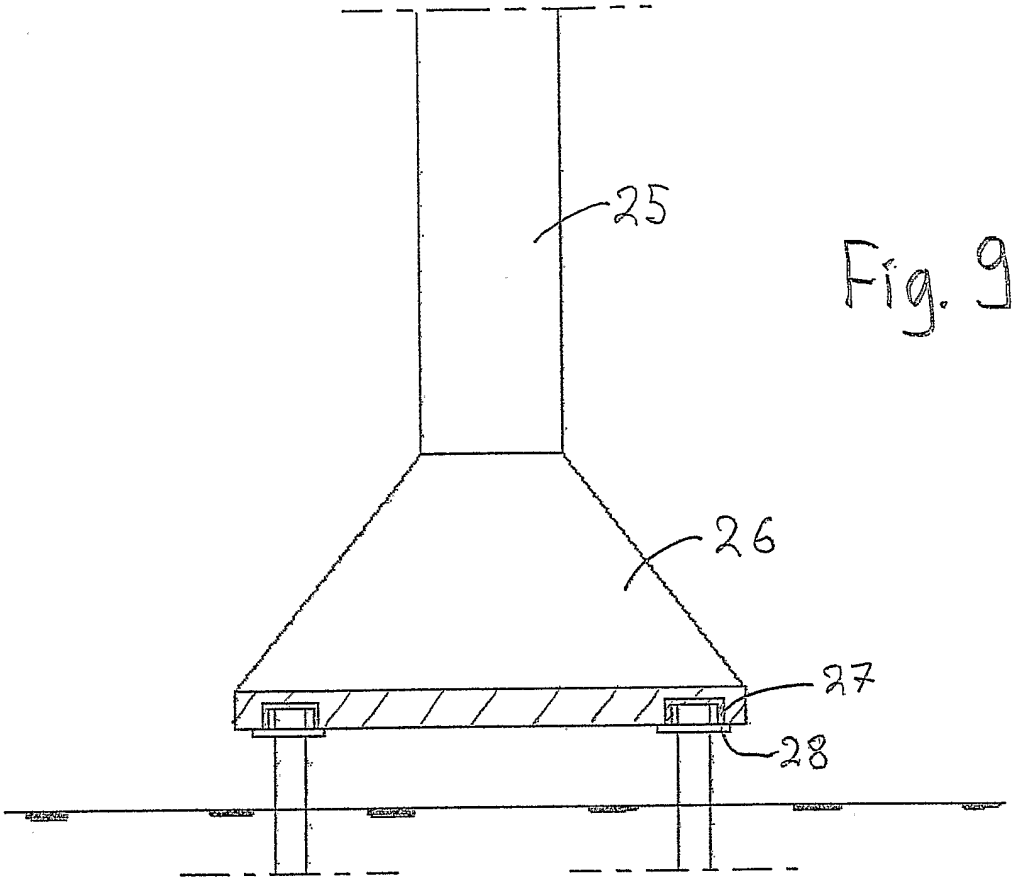


Fig. 9

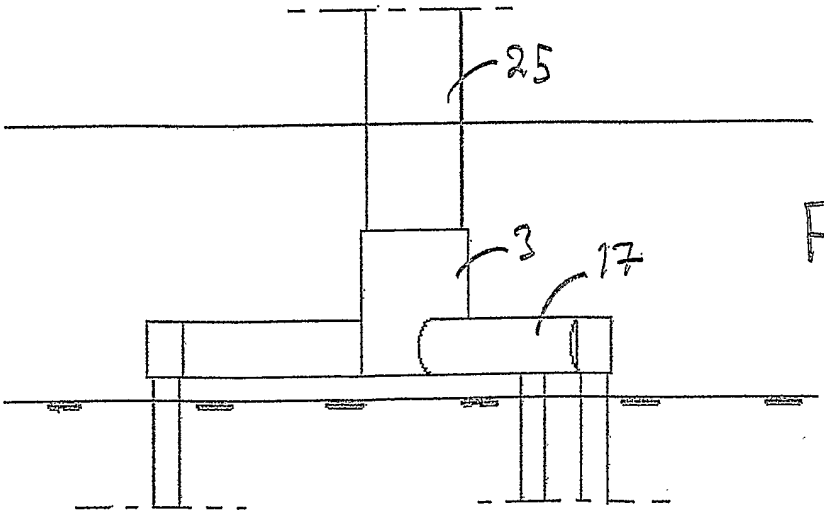


Fig. 10

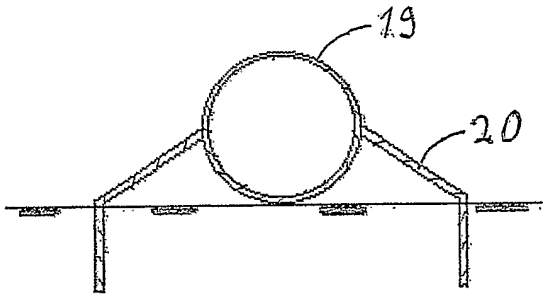


Fig. 11

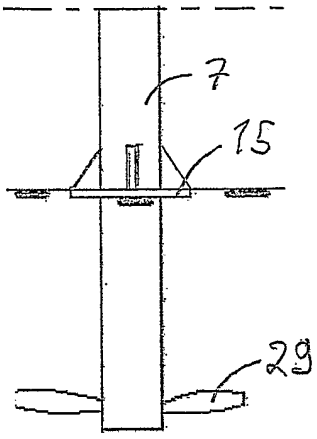


Fig. 12

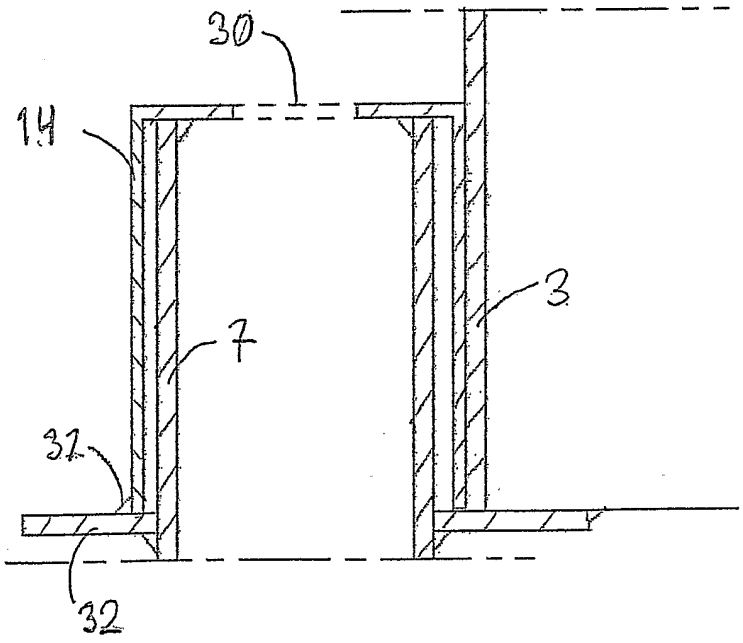


Fig. 13

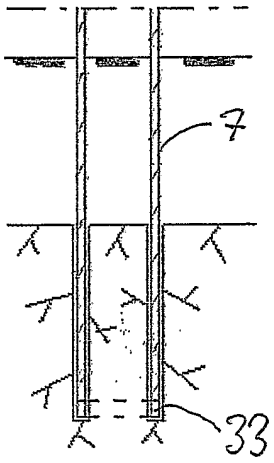
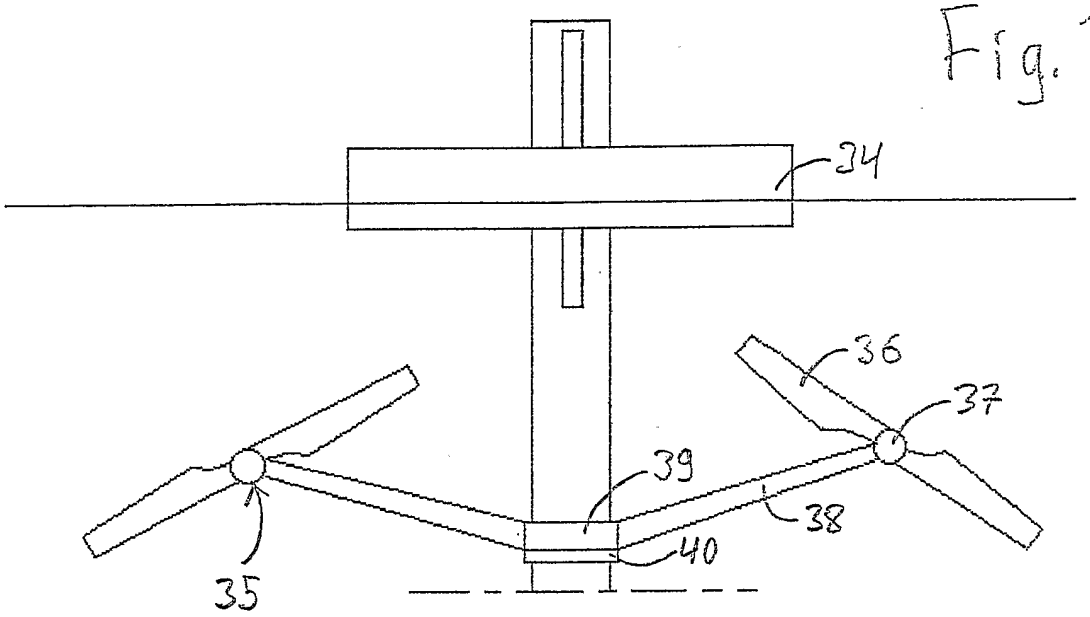


Fig. 14

Fig. 15



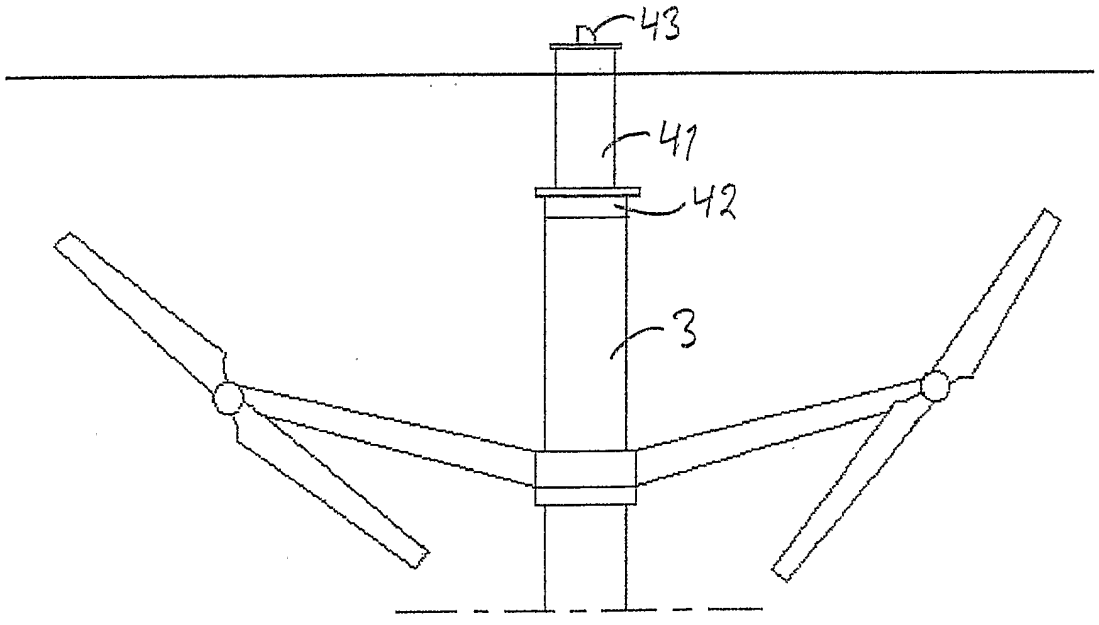
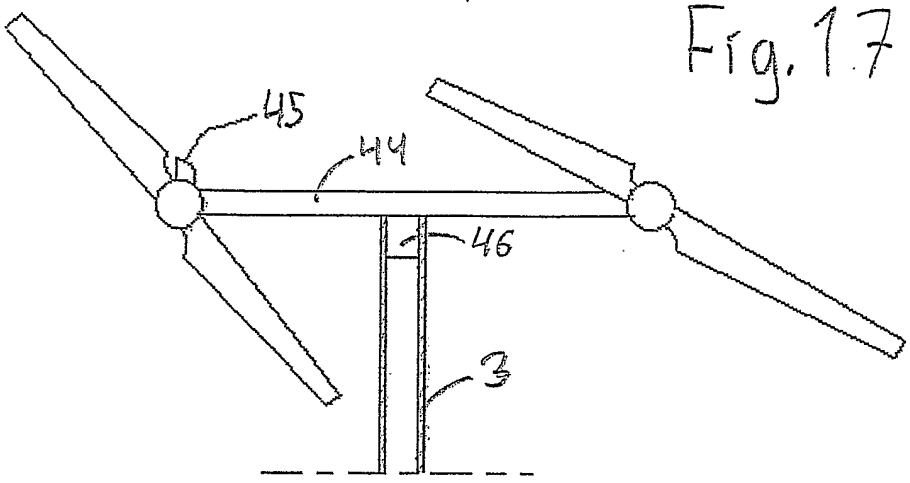


Fig. 16

Fig. 17



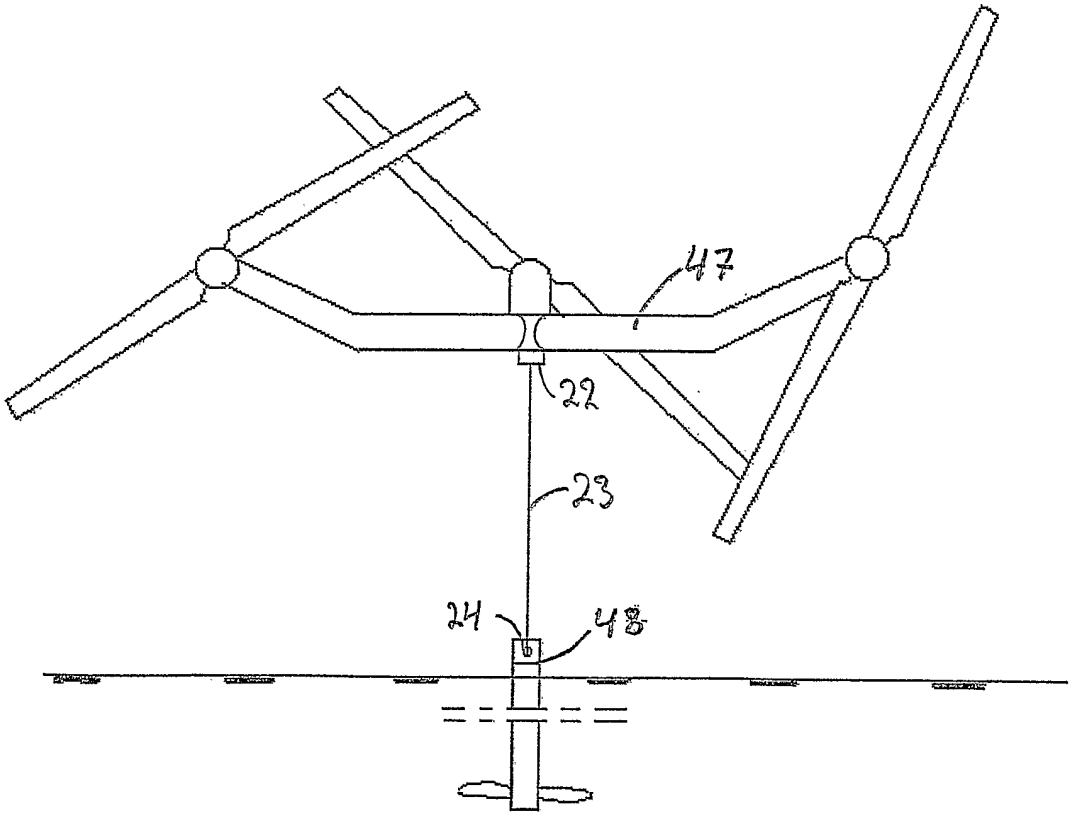


Fig. 18

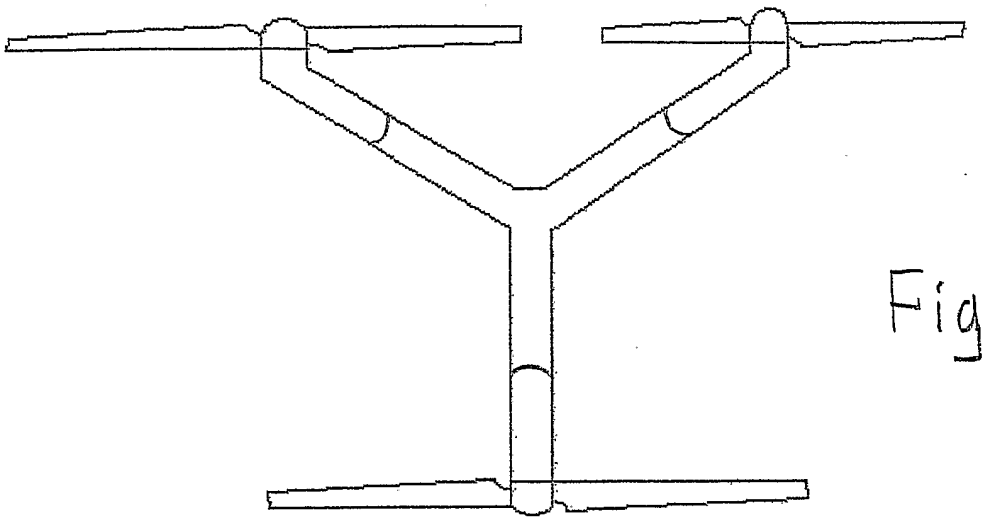


Fig. 19

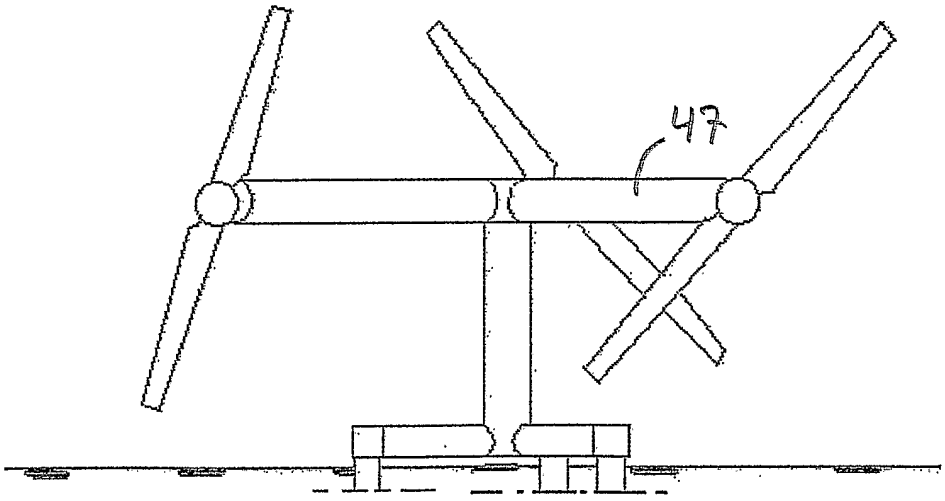


Fig. 20

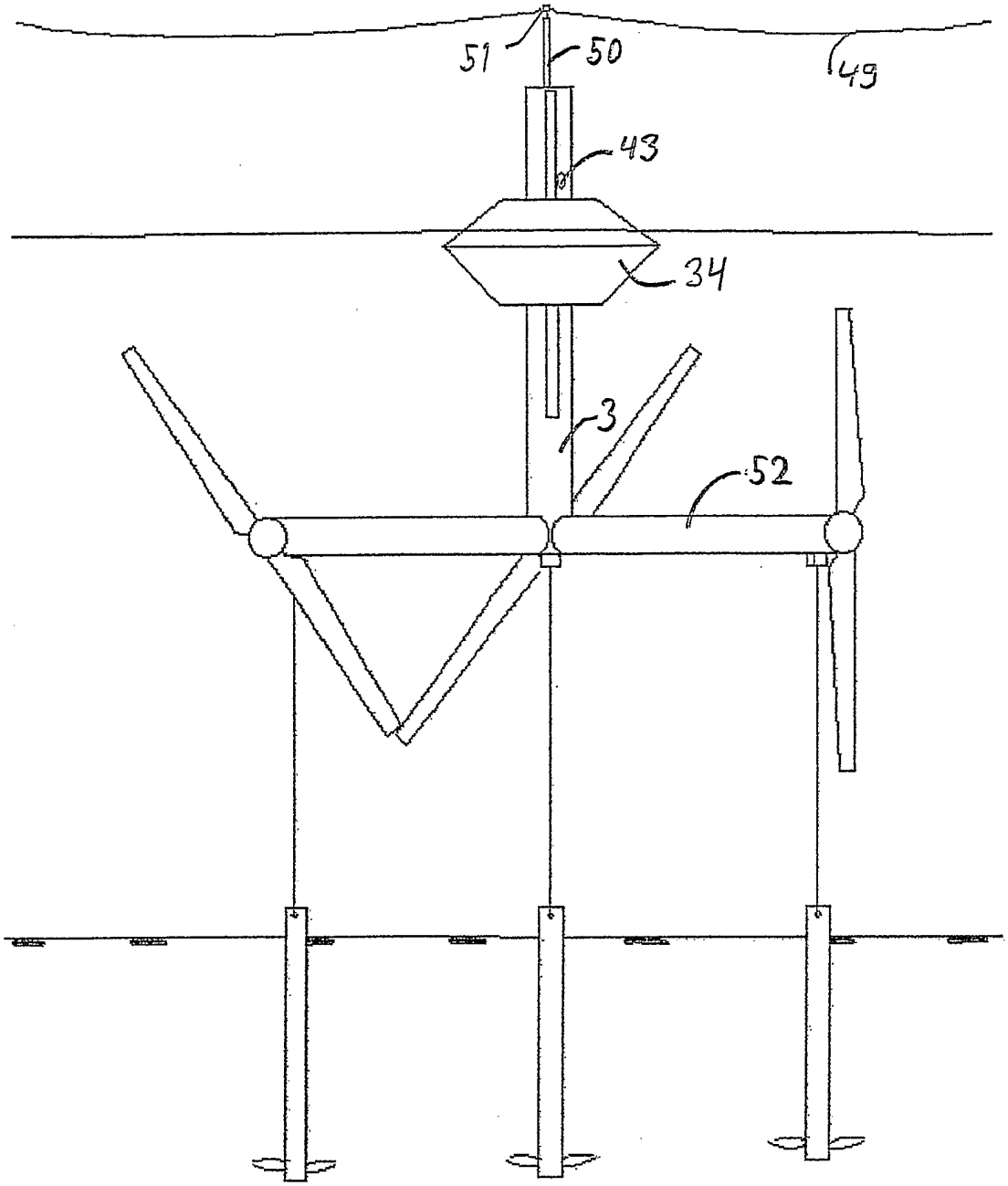


Fig. 21

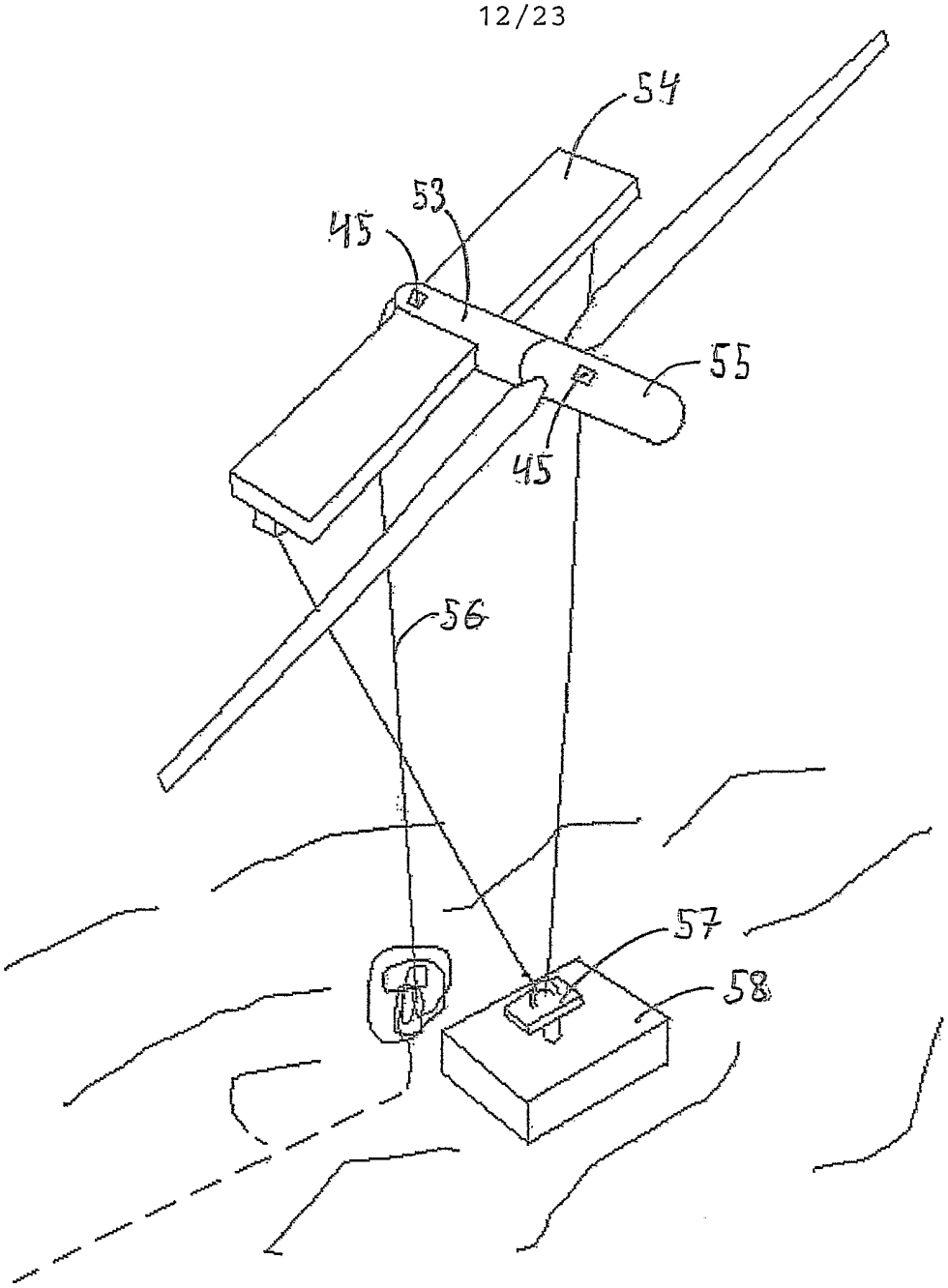


Fig. 22

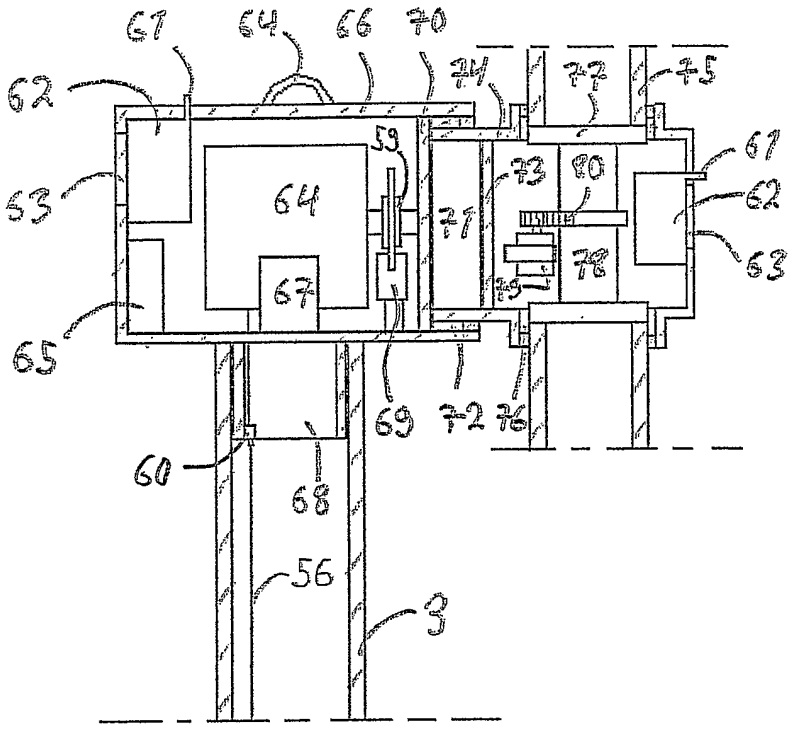

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Fig. 23

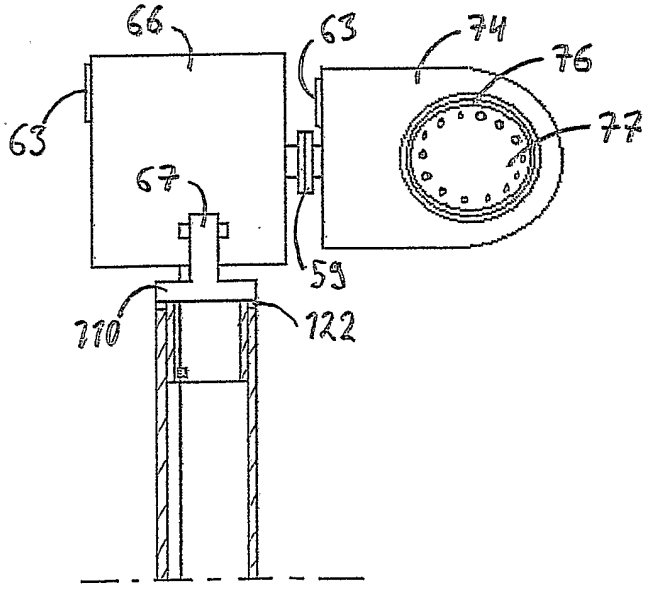
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Fig. 24

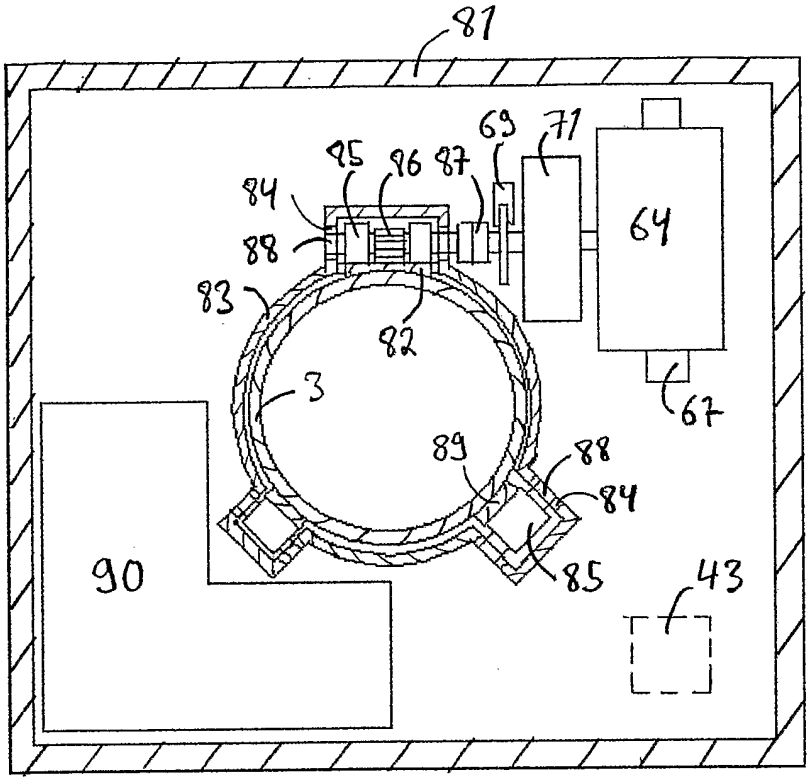
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Fig. 25

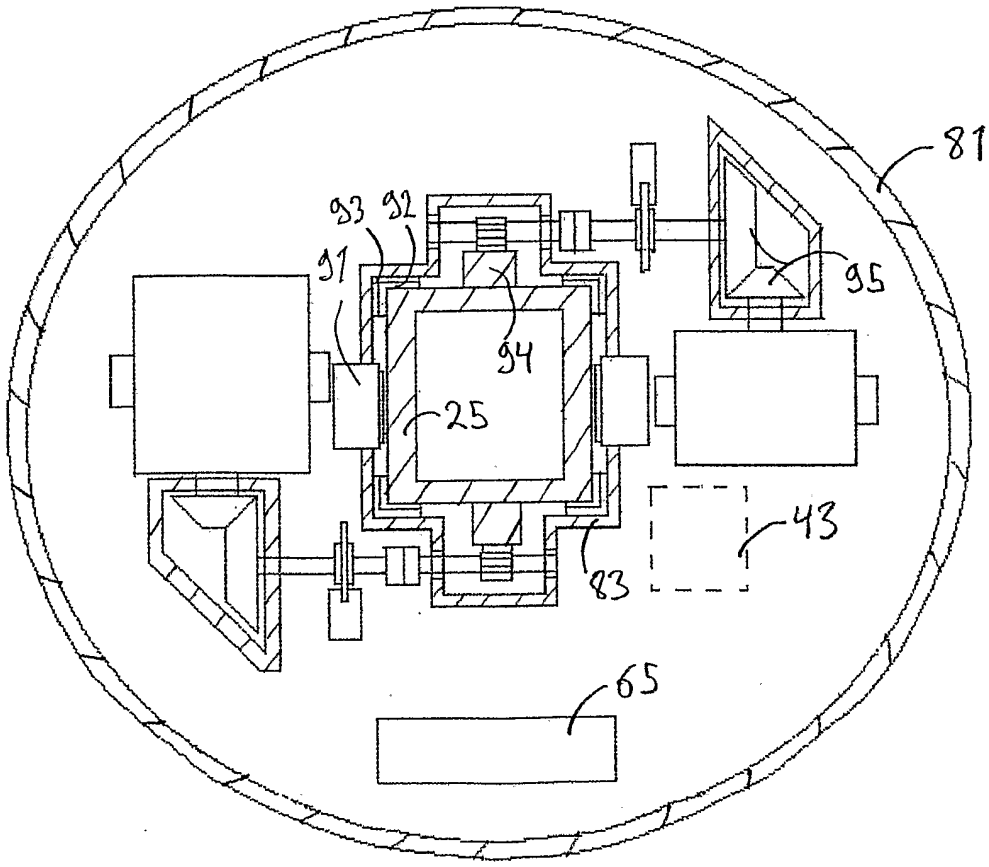
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Fig. 26

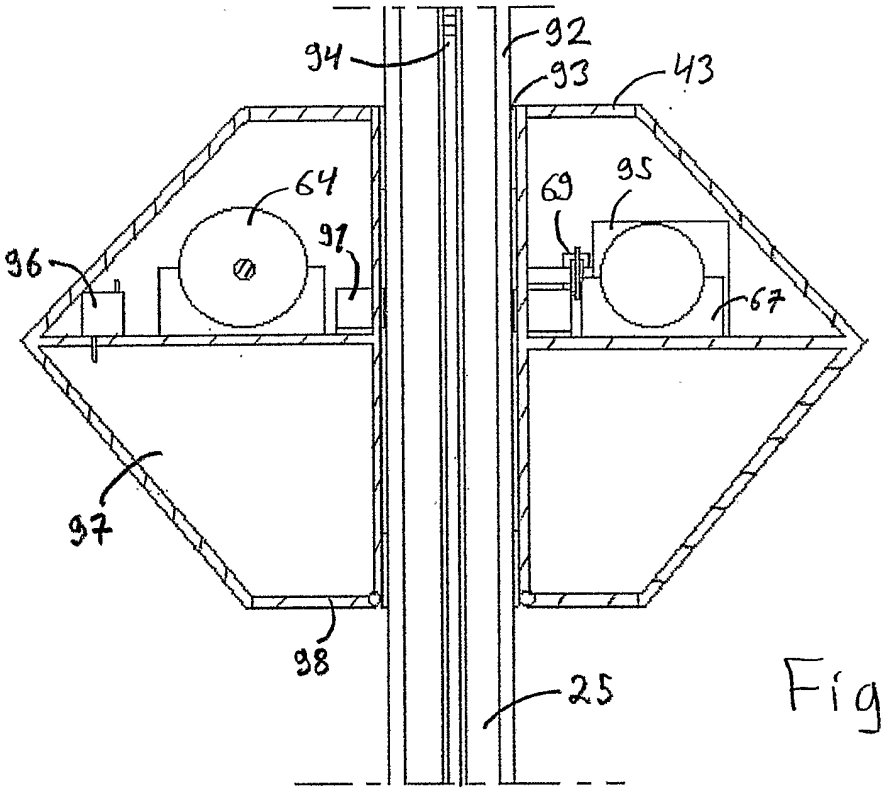
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Fig. 27

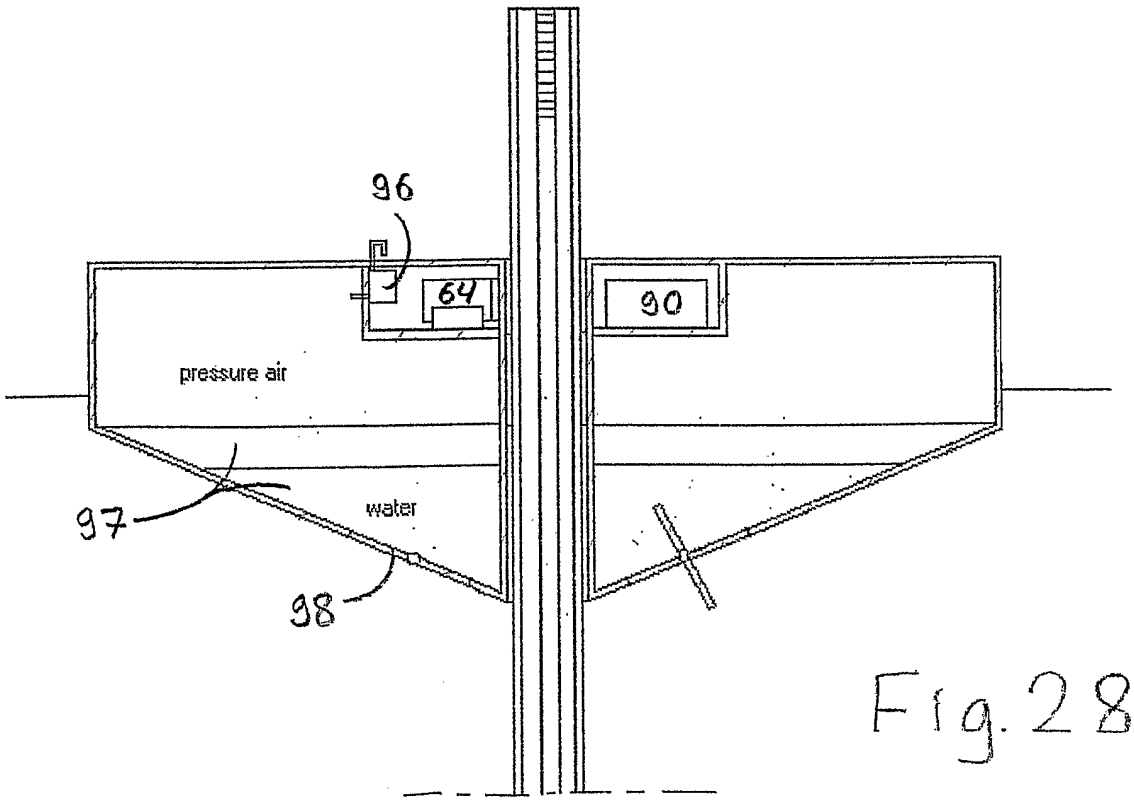
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Fig. 28

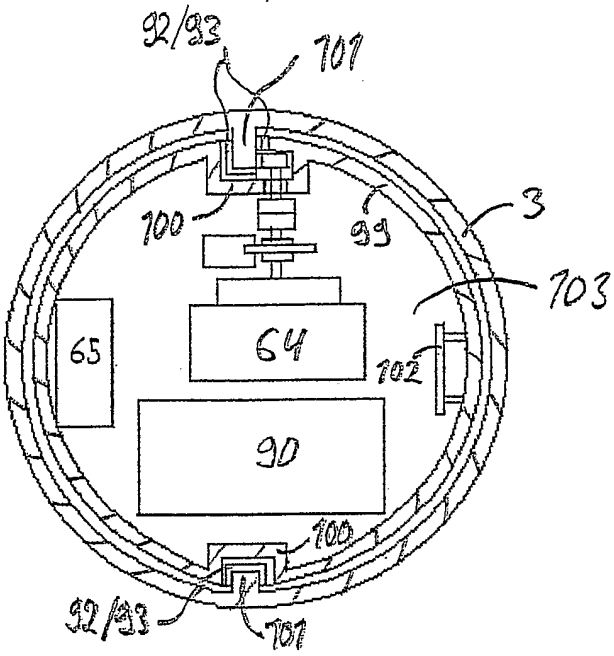
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Fig. 29

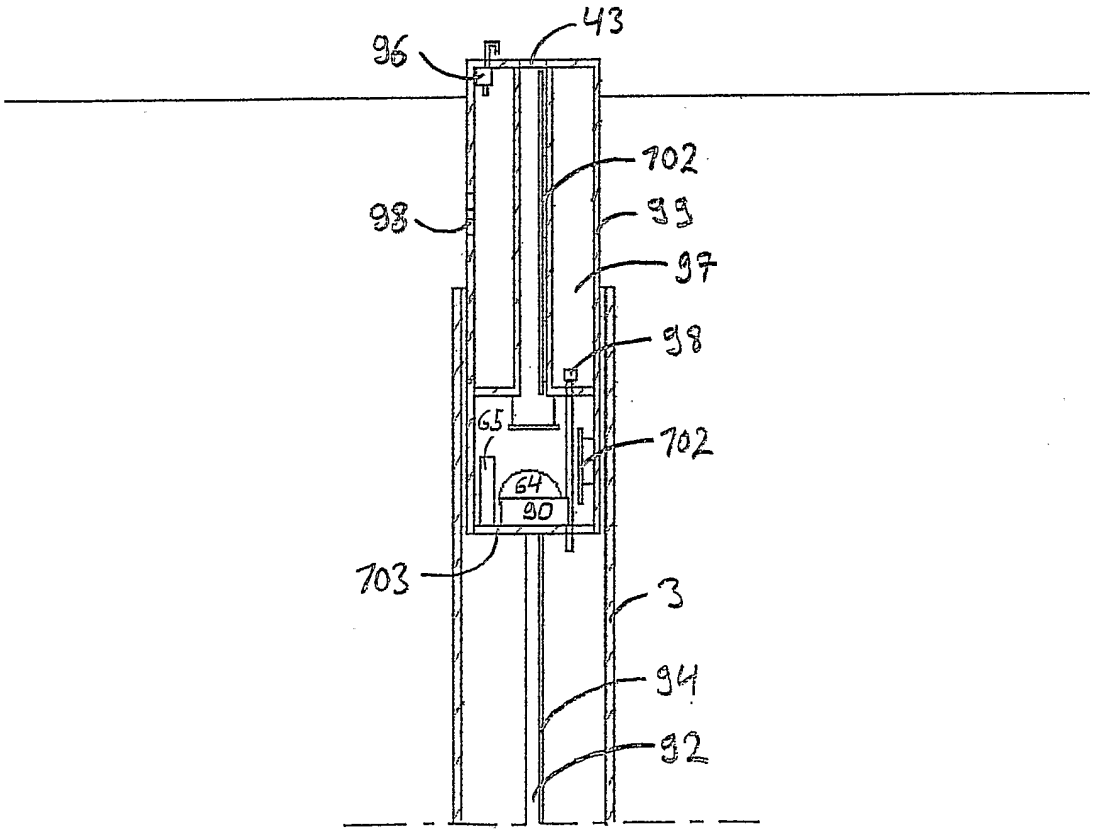
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Fig. 30

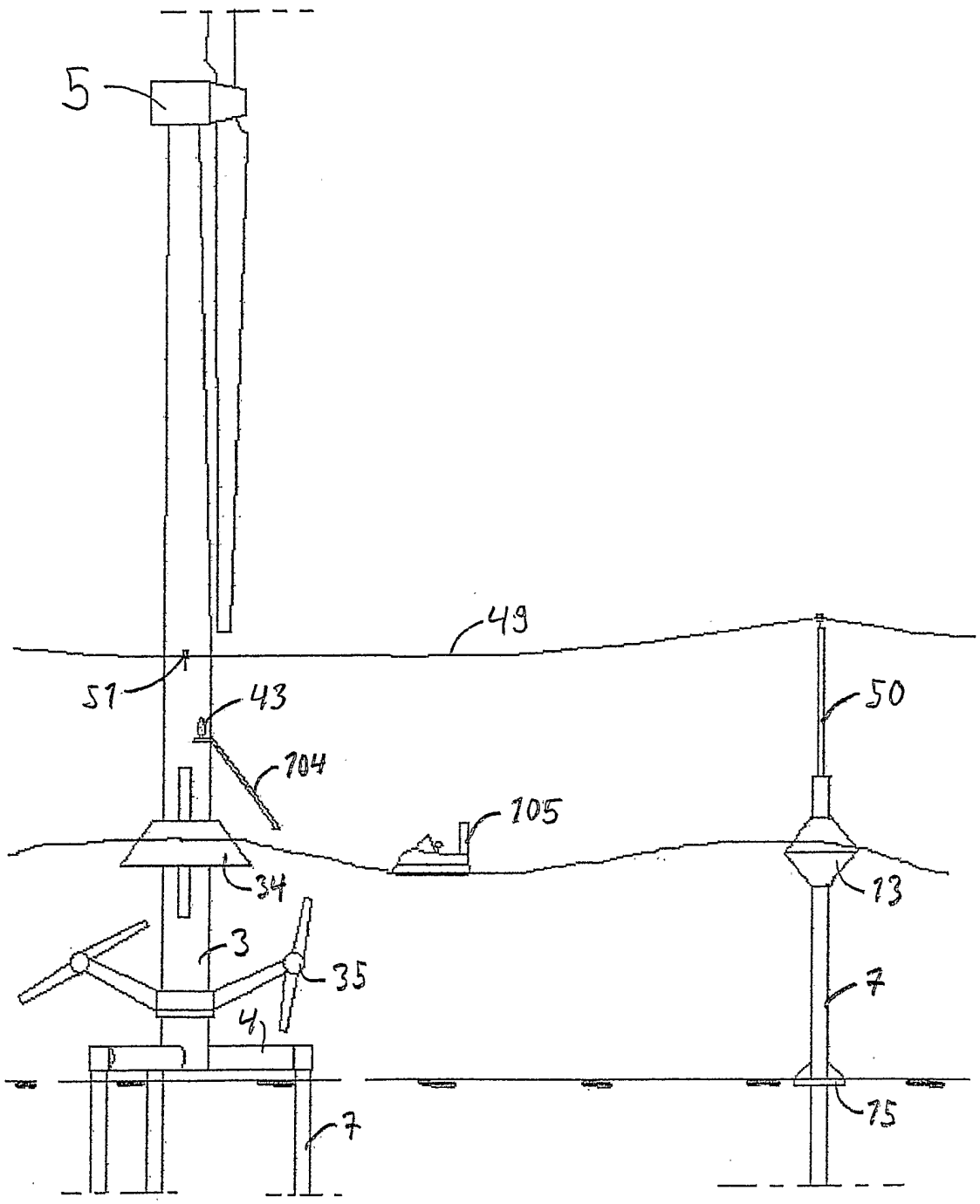

Fig. 31

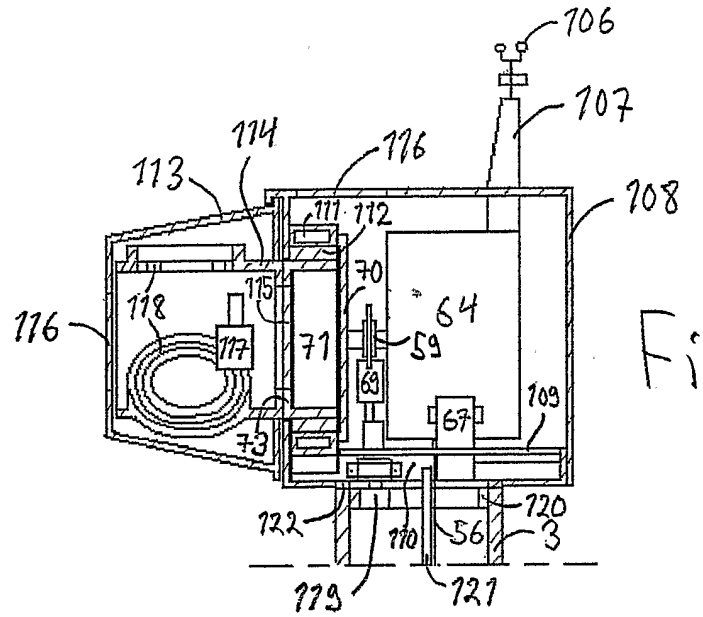

Fig. 32

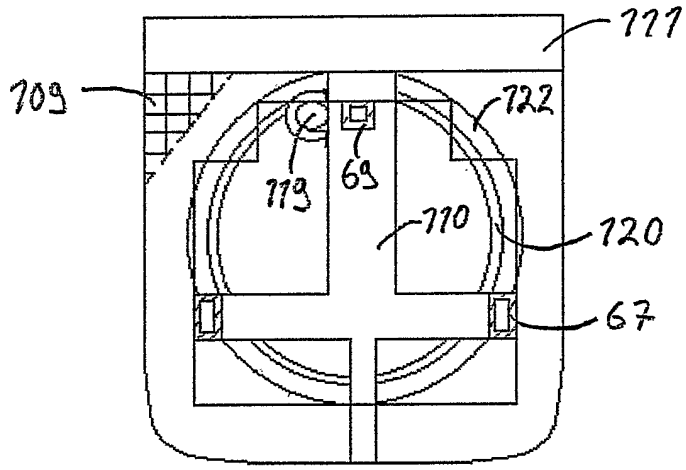

Fig. 33

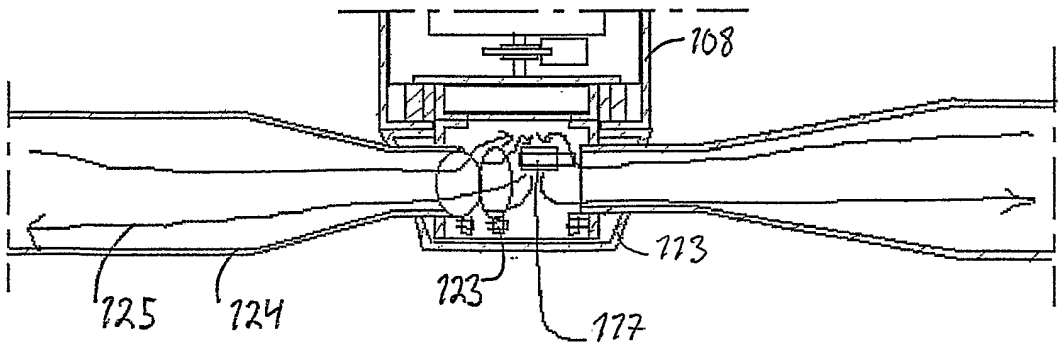

Fig. 34

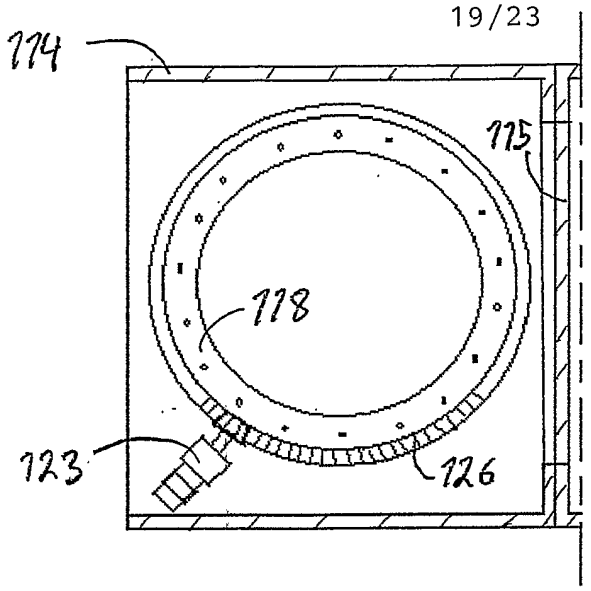
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Fig. 35

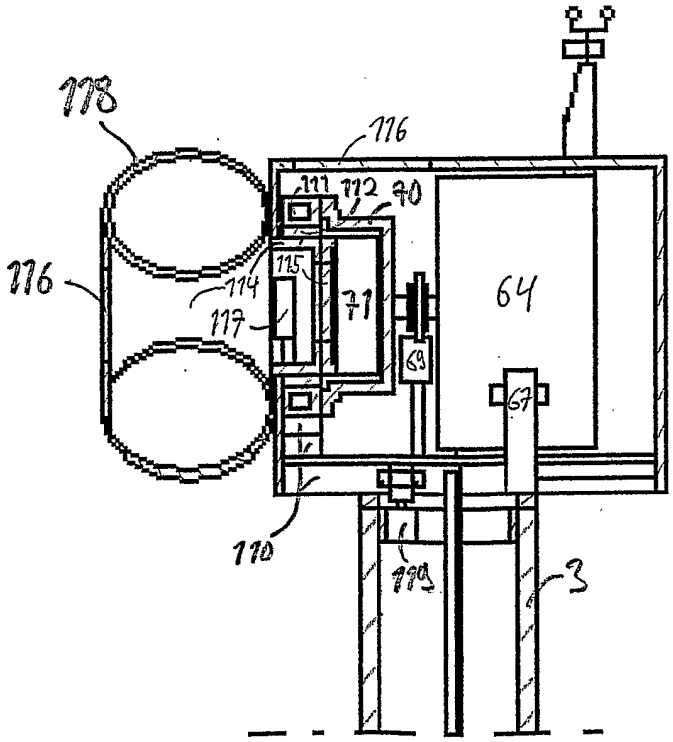
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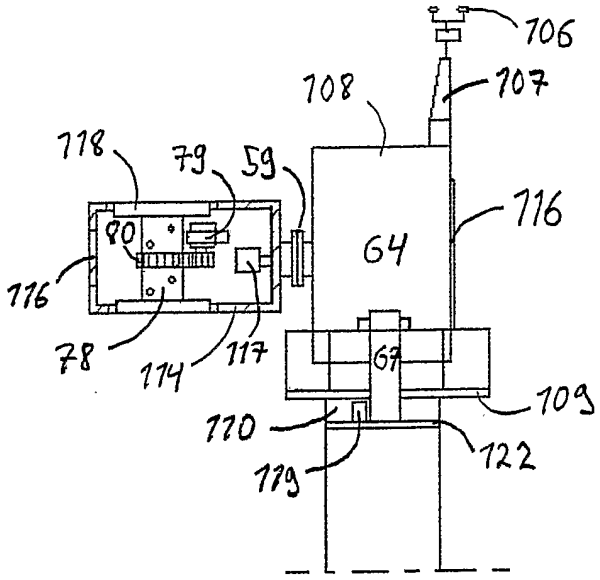
Fig. 36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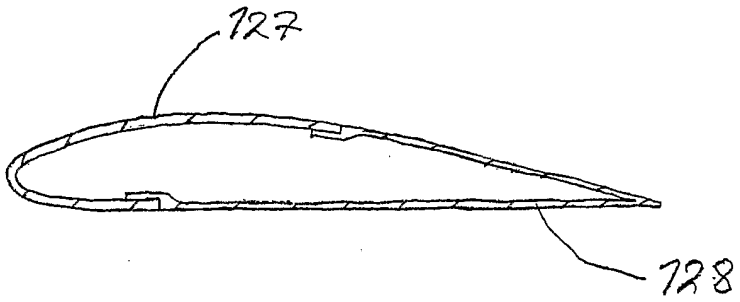
779

Fig. 37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728

Fig. 38

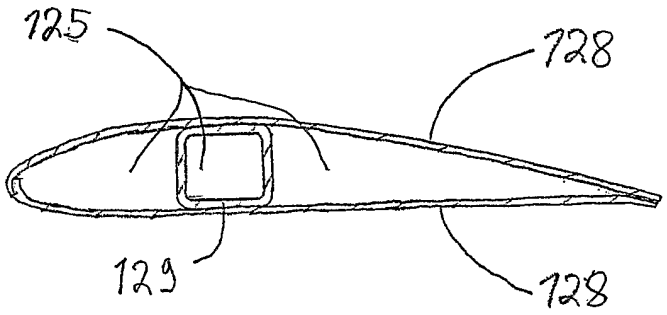

Fig. 39

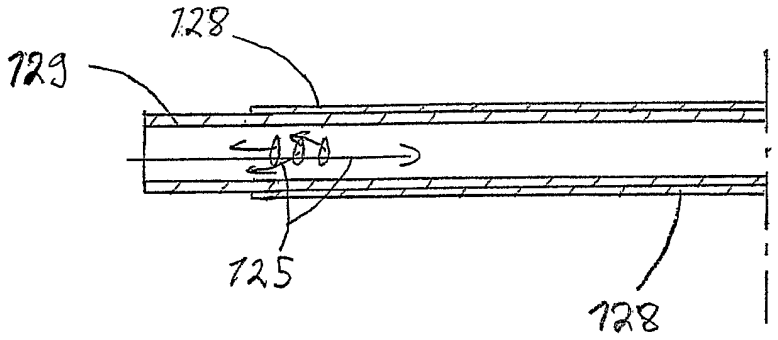

Fig. 40

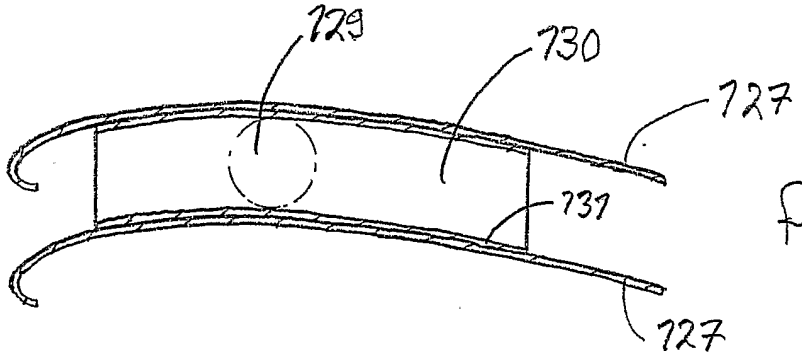

Fig. 41

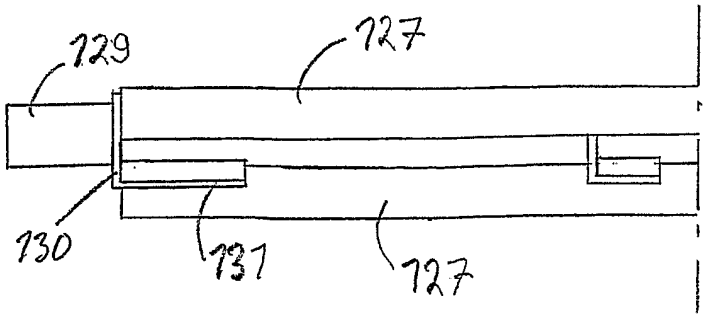

Fig. 42

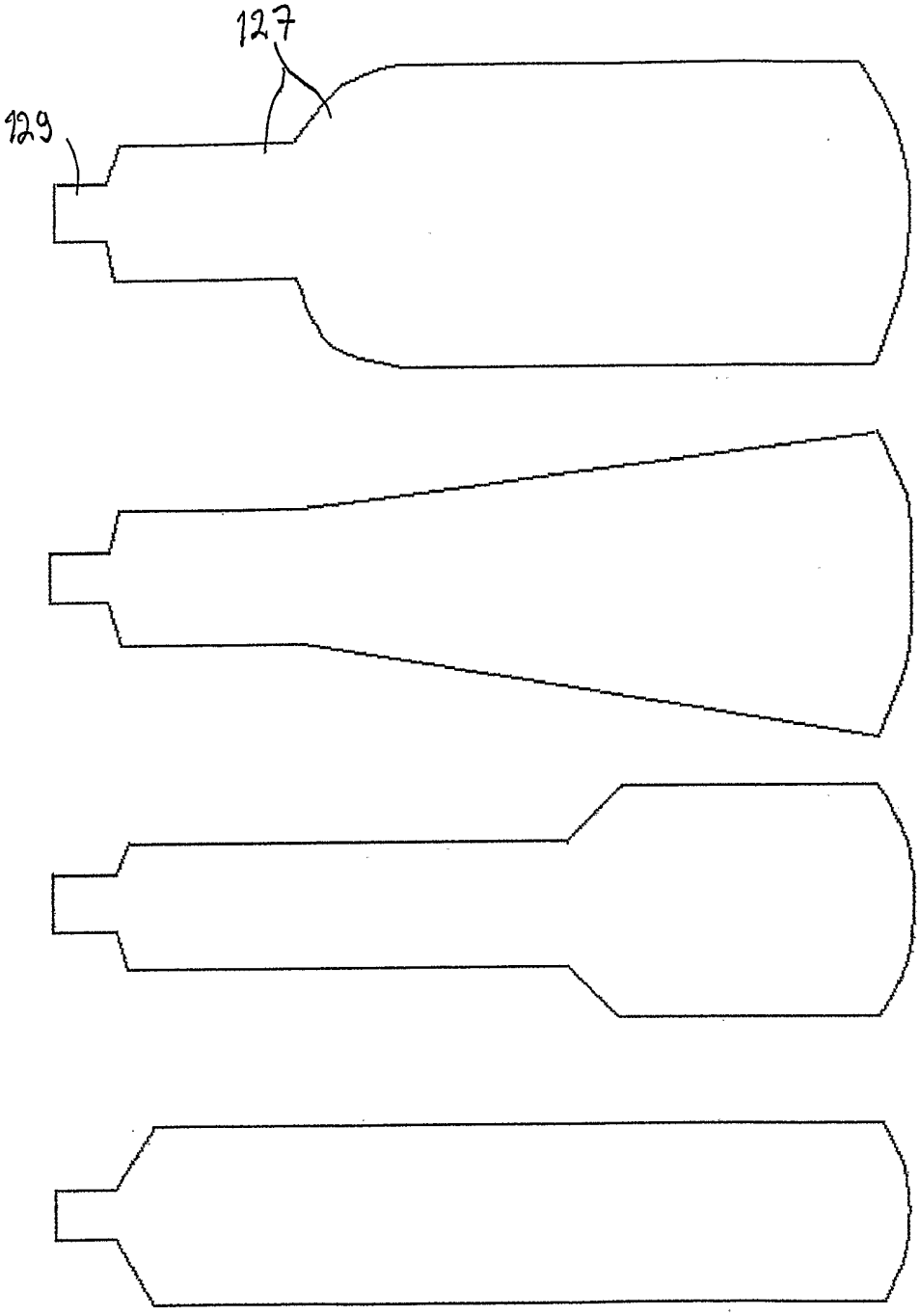

Fig. 43

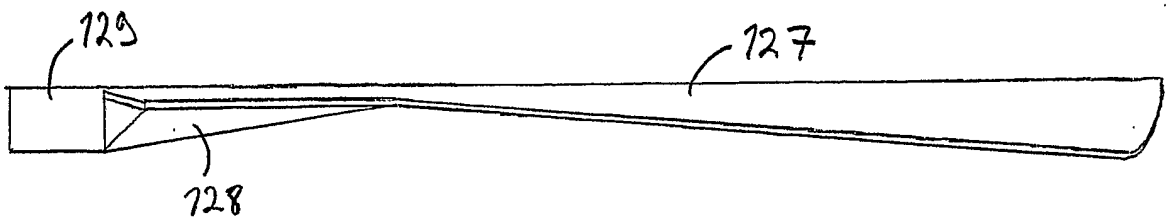

Fig. 44

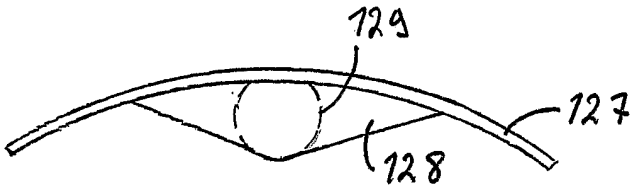

Fig. 45

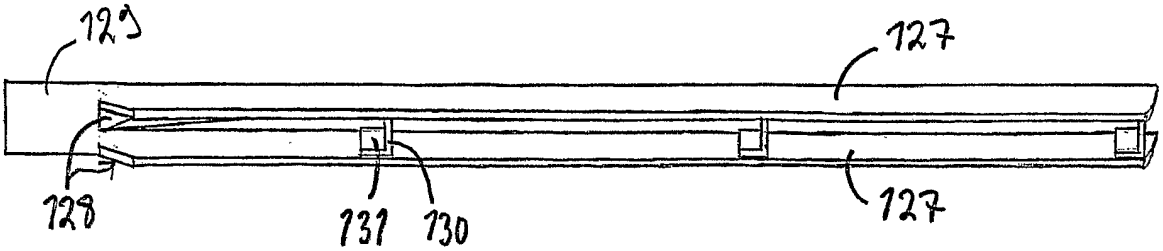

Fig. 46

INTERNATIONAL SEARCH REPORT

International application No.
PCT/FI2005/000289

A. CLASSIFICATION OF SUBJECT MATTER

IPC 7: F03D 9/00, F03D 11/00, F03B 13/12, E02B 17/02

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7: F03D, F03B, E02B, B63B

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

FI, SE, NO, DK classes as above

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

EPO-internal, WPI, PAJ

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	DE 4322980 A1 (HAPP LUDWIG) 06 October 1994 (06.10.1994), column 5, lines 18-35, 52-54, figures 1 and 2; column 7, lines 41-51	1-26
X	US 2003/0137150 A1 (SHU CHAO-FU) 24 July 2003 (24.07.2003), figures 1 and 8	1-26
A	JP 2001-221142 A (NAGASHIMA MASAYA et al.) 17 August 2001 (17.08.2001), and abstract from Patent Abstracts of Japan	

☐ Further documents are listed in the continuation of Box C. ☒ See patent family annex.

* Special categories of cited documents:

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"E" earlier application or patent but published on or after the international filing date

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"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
21 September 2005 (21.09.2005)	23 September 2005 (23.09.2005)

Name and mailing address of the ISA/FI	Authorized officer
Patentti- ja rekisterihallitus PL 1160, 00101 Helsinki Facsimile No. +358 9 6939 5328	Pirjo Kauraala Telephone No. +358 9 6939 500

INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.
PCT/FI2005/000289

Patent document cited in search report	Publication date	Patent family members(s)	Publication date
DE 4322980 A1	06/10/1994	None	
US 2003/0137150 A1	24/07/2003	None	
JP 2001-221142 A	17/08/2001	None	