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(54) Title: TURBINE AND CENTRAL STATION ON WIND POWER

(57) Abstract: The turbine with movable wings on wind power, in it n-angles construction (1), which on it has movable wings (2), which has consist from the body of the wings (3) and mechanism for turning on (4) which has consist from the bearings (5), shaft (6) and staples with a body wings (7) consist more limits for turning on of the wings (8), shaft for transmission of work with traverse system in the center of the turbine (9), bearing for more easier rotation of the turbine (10), adequate bumpers for buffer of strokes the wings from the construction of the turbine (11) and additional affixes, by need (12). The power of the turbine beside the wind power determines a length's of sail or lever (13) and size of the wing (14). The appliance of the turbine, i.e. it install in more level central stations (15), beside architecture construction (15) require and additional equipment for using of useful work of the turbine in the central station (17).



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TURBINE AND CENTRAL STATION ON WIND POWER

1) SECTION OF TECHIC ON WHICH INVENTION RELATE

This invention relate on the new principle turbine work on wind power and a new principle making central station on wind power (on the basic of specify turbine) for production of electric energy (for irrigation or using mechanical energy made by work of this central in any other purpose). According to the international classification (IC) classified as:

F03D 5/02

2) TECHICAL PROBLEM

Through the history up today was used various aspects of exploiting and production of energy. Today, in time of more bigger ecological crisis, its needed to find out as much as better way production and exploiting of i.e. "pure energy". Development countries invest huge resources in exploiting of wind and construction of i.e. windmills.

Nowadays turbine on wind power are stationed straight, are made structural and big dimensions and its transport is very weighty, assemblage, making, and maintenance. Neither accomplished nor important applied series connection of turbines because of derivation bigger power and bigger energy, and more possible previous turbines are not specialized.

3) STATE OF TECHNIC

There are a big number of windmills in the world (central station on wind power) for production of electrical energy (or any other mode using of mechanical energy produced by work of windmill e.g. mills). Even more modern solution of turbine and central station on wind power beside its good nature has big faults: Construction of turbine and central station is very complicated in sight of making, transport, assemblage and maintenance. Construction of previous central station is possible only for several world firms specialized for this mode of work and very expensive. Maintenance, transport, and assemblage request additional specialized equipment, which is also very expensive.

Turbine of nowadays-central stations is stationed straight, is big dimensions, and is located on a high height and dynamos are also risen on a high height. Adjusting of direction of wind request additional turning of dynamo. There are a number of countries on the world, which has no one central station on wind power, and they have in their country enough circuit of air, which has mean they are no specialized and more profit or they are very expensive and demanded.

4) EXPOSURE OF ESSENCE OF INVENTION

The aim of this project is as better and mass use “free of charge” wind power. A great advantage of this project, in time of bigger ecology crises, is production i.e. pure energy. An idea, to be made more ideal turbine, with more possible exploiting of circuit of air (wind) based on three, through history already proved method (experience and appliance) using of wind: 1) sails on the ships, 2) meteorology instrument for measuring speed of wind, 3) knife for cutting.

THE PRINCIPLE OF WORK

In center of turbine is an axis with bearings and covers and divided with steel structural (or structural from some other adequate material) on eight equal parts. Steel limbs of turbine are connected with double eight angles steel structural (principle of structural are clearly see on the *figures 1 and 2* and this structural considerable better overcome air resistance by moving, than full). On the ends of structural there are eight movable wings (sails).

The wings are do not turning on completely up to the column steel structural (foremast), already stopped to the angle of 45° before (foremast) structural which enable one additional circle from the steel structural (has shown on *figure 1*).

This decrease turning on the wings (decreases turning on or reduce an angle of motion) enable that the larger number of wings practice turbine work, and also decrease of motion and abrasion due to the work.

Outside steel structural is not around it is made in profile of eight angles and it is need that the wings could make a bigger motion to outside and that make a better “cutting” of air and less resistance.

On *figure 1* all the wings (sails) are mark with numbers form 1 to 8, where are more additional markers: + (*plus*), - (*minus*) and 0 (*zero*). This remarks has meaning: + (*plus*), present the wings in “working” position, - (*minus*) present the wings which has resistance and 0 (*zero*) present the wings which has no resistance (negotiable resistance).

The wings 1,2 and 3 have remark + (*plus*) are working wings which a power of wind turning on the turbine into round. The wing 4 have remark 0 (*zero*) and + (*plus*) what means that this wing drive turbine in round and there is no resistance (negotiable resistance). The wings 5 and 6 have remark 0 (*zero*) and - (*minus*), and it means that they have minimum air resistance. The wings 7 and 8 have remark 0 (*zero*) and they have no air resistance because they are turned “on knife” in relate on wind direction.

THE DIRECTION OF ROTATION WIND TURBINE

This kind of turbine it could be determines the direction of moving with no considering on what side works the wind. The direction of moving determines with location on where is install moving strength.

For example, if the wings located as on *figure 4*, i.e. from the left side of the structural (foremast), the direction of turning on the turbine is reverse of direction of moving a needle of clock.

If the wings locate from the right side of the structural (foremast), the turbine will rotate into the direction of needle of clock.

THE POWER OF THE WIND TURBINE

The power of the wind turbine is determined: 1. Wind speed, 2. The length of the steel structural (foremast as a lever), 3. The size of the wings (sails).

1. On the wind speed we can't influence, because it's a nature thing, but it can be determine location in the nature where are the circuits of air very noted.
2. The length of structural (foremast) received a bigger power because we used it as a lever.
3. The length of structural (foremast) determines the size of the wings (sails), respect of the length half of diameter of turbine.

With the half diameter r we get the volume of the circle of turbine ($O=2r\pi$). that volume O divide on 16 the same pieces ($O/16$) and mark on the perimeter the spots which has to be divided on 16 identical arches. When the flat line connect two next points we receive width the wings of turbine *figure 3* (altogether width with shaft and bearings). This is example for eight angles of the turbine. For m-the angle profile of the turbine the principle of calculation is the same, only the volume divide on $2xm$ the same pieces. The length of sail is received when the width the same one multiply with n (where is n positive number and his the most optimal value which it has used in these experiments is 2). Detach wing has shown on *figure 3*. By chance moving of the wings of turbine, it comes to the hitting of steel structural on the left and right side. It wouldn't come to the deformation, even disintegrate of wings, install the buffers of stroke. They are made of on well-known principle of bumpers (oil, air, on the springiness...). They install on an adequate places of the structural in relate of assortment of bumpers.

5. A SHORT DESCRIPTION OF DRAWING

In the accompanying drawings stroked more picturesque and together the most simply explain a principle of turbine work with movable wings on the wind power. As we watching the drawings we can see the basic principle of work as an appliance of turbine on wind power.

Figure 1 shows turbine with movable wings from the view above, which has take place under the operation of wind. From this figure is clearly seen schedule of movable turbine wings.

Figure 2 shows appearance the turbine on wind power observed in segment where are from the eight possible wings has shown only two, cause of picturesque. From the figure has seen shaft, bearings, a view of structural and wings as an attach places on a shaft (transmission belt, universal joint or others).

Figure 3 shows a wing of the turbine with it appearance and dimensions, which has determined on a basis of half diameter of the turbine on a present way. In a width of the wings are numbered a system with bearings and shaft, which enable turning on of the wings.

Figure 4 shows central station on wind power with 5 floor and ground floor, as a majority needed accompanying units (lift-jack, protect board fence, universal joints, low-range gear lever, dynamo, bearings...).

6. DETAIL DESCRIPTION LESS ONE OF THE WAY REALISATION OF INVENTION

The turbine with movable wings could find its appliance on all places, which has used classical windmill, so just a replace the turbine and the purpose is the same. The most complete description appliance of this invention gave *figures 2 and 4*.

The main advance of this turbines in relate to the classical is possibility it install in big more level central stations (as has shown figure 4, central station with 5 floors for turbine). The big advance of this turbines as a this central stations on wind power is in its technical performance cause: neither complicated it do not install nor need some special technology, easy of maintenance, easy of transport and maintenance. The ground floor is used for the location of dynamo for the production of electrical energy (and / or power unit for pump water) and device for a transmission of movable force (low range gear levels). In compound of the ground floor it is located a room for operator with all necessary instruments and devices for manipulations, wet nodules and premises for stay of personnel.

Structural construction of floors central station (except ground floor) content only carrier columns from the reason that the air could circuit for all around sides as on open air. Through the center of central station transit, which is, compound from the several parts. On the board of the (floors) installed are bearings with own shafts, flange, and universal joints. All induced are clearly show from the *figure 4*. The upper floors have protected fence, which enable safe walking of personnel for assembler, survey, and technical maintenance. The floors are connected with steel stairs that the workers can normally move on the floors. On one edge of the central station install is electric lift-jack, which serve for lifting of parts and equipment which has install on every floor. Only for install of structural of central station used only special car lift-jack, and all other assumed lift-jack which has installed on facility.

These central stations are located on places where is continually present strong wind which inactivate normally work of personnel by chance assemblage and technical maintenance. To be protected personnel it can be incorporate steel protect cover, which has hang on sidewise sides of central station, whereby closure the whole facility and personnel with lighten and heating and has normally conditions for assemblage and technical maintenance. Even that the central station should be run in case of too much strong wind or thunder storms and strokes, the operator could close one or more floors and with that protect inside plants from possible damage. The platforms of open floors are covered by rubbers or some other specialized material because of protect a water, snow or sand and add up into the drainage ditch installed around the platforms. On a places where are cold winters in floors has installed pipes for central heating in case of deposit of snow or ice. Induced heating will used only for melting those deposits. Operator do video survey and follow the work every turbine by two cameras which are installed on every of floors. For protection from the thunder obligate installed lightning-rod with ground.

The aim of this project was to show principle of turbine work and central station on wind power without need to come in little details (which has by chance making of project for central station should have to elaborate up to very little details experts from particular areas). All measures were given only to be showing more reality picture of this project.

We believe that it is still unclear questions on what in a future period will give the answer-detailed research from all areas, which are needed for necessary realization.

7. THE WAY OF APPLIANCE OF INVENTORY

There is large number of places in the whole world where are strong express circuit of air and where on that places the people has problem with electrical energy, irrigation etc. Up today solutions exploit of winds apparently are not enough as financial as performance. This central station and the turbine can make any serious metal industry and every country can provide all necessary measures for making of central station and its maintenance, of course with dynamo and the other specialized means, which could be order from renowned producer. Realized of this project it comes to large employment (placement) of workers in metal industry and maintenance and assemblage of its central stations and it used so called "free" or "pure" wind energy. There are also comes to the growth of employment in all branch which support this project from the architecture to the meteorology. Of course, it is clear that with this patent this thing is not comes to the end and it is need to make complete project which include machinery, structural, electrical and meteorology projects. It is a great advantage in that when it makes project for this one central station (optimal dimensions) it worth for construction all others central stations whatever they placed.

PATENT CLAIMS

1. The turbine with movable wings on wind power, **characterized by**, is consist of metal construction, movable wings with matched bearings and shaft which enable turning on the same, additional affixed of construction, limiting of inner turning on of the wings, bumpers which lessening stroke of wings from the construction and bearings located with or without shaft in the center of the turbine.
2. The turbine according to the claim 1, **characterized by**, that induced metal construction (from a steel or some other adequate material) could eight profile or n-angle profile (n-natural number compute for need profile of construction which present and a number of wings of the turbine) and that be, by need double or more affixed according to the request it dimensions as to be more optimal solute in a view of easy of overcoming air resistance.
3. The turbine according to the claim 2, **characterized by**, that induced metal construction be eight angles profile or n-angles profile are made of on that way conjunctive limbs of construction i.e. that limbs which link center of construction and the end the same (sail or lever of wings) are connected from the center of construction up to the middle of the side eight angle (n-angle) so the wings of computed value right framed from the lever (sail or staple) to the eight angle (n-angle).
4. The turbine according to the claim 2, **characterized by**, that on it construction consist and movable wings with mechanism for turning on.
5. The turbine according to the claim 4, **characterized by**, that a number of movable wings depend of number n, where is number n —a number of angles profile of construction and it optimal value i.e. value used by the assure principle of work is 8.
6. The turbine according to the claim 4, **characterized by**, that mechanism for turning on movable wings consists needed bearings and shaft, which enable an easier moving the wings between two-edged positions, determined by the construction.
7. The turbine according to the claim 4, **characterized by**, that construction of movable wings should make from the material which enable enough easier of moving and together adequate hardness and elasticity that wouldn't come to the no worse than deformations by chance contact with bumpers on the construction and / or by chance contact with bumpers on the wings with the construction, that the construction of wings made of do not come to the deformations or damages of size which has under the operate of wind.
8. The turbine according to the claim 7 **characterized by**, the size of wings should cover easier material from the plastic, tarpaulin, soft materials, and similar cause of easier of moving and slight stroke of construction.
9. The turbine according to the claim 1, **characterized by**, that consist the bumpers or buffer of strokes of the wings of the construction which has adequate made and located on the construction and / or on the wings.
10. The turbine according to the request 1, **characterized by**, that consist additional stabilization of construction which has adequate made of and located on depend of dimension of the turbine, i.e. need for stabilization.
11. The turbine according to the claim 1, **characterized by**, that consist inner limit in circle profile or n-angle which limit inner turning on of the wings till the value of

compute angle of turning on from the position to lean wing of n-angles construction till the inner limit.

12. The turbine according to the claim 1, **characterized by**, that consist shaft adequate affixed in the center of the turbine by to the transmission system used a work of this turbine, to consist adequate bearings which enable more easier moving of the turbine.
13. The turbine according to the claim 1, **characterized by**, that beside independent work and using of it work in production purposes of electrical energy, irrigation, using as a mill etc. installs in more level central stations various dimensions for production of electric energy and for irrigation.

figure 3



