Vortex Oscillatory Mill
Topicality

Existing devices for hashing, crushing, separation, acceleration of heat transfer and other technological processes of vortical, vibrating, planetary-centrifugal and other types have a number of serious disadvantages.
We know how to create intensive vortical and oscillatory motions of the processed environment by means of mechanical oscillations of the special form (KNOW HOW).

The description of vortex oscillatory effect and advantages of offered technologies in comparison with traditional technologies are shown on our page:

http://www.vortexosc.com/modules.php?name=Content&pa=showpage&pid=16
Vortex oscillatory mill has much better characteristics in comparison with traditional mills and will force them out from the market.

The basic advantages of vortex oscillatory mill in comparison with analogues:

1. Centrifugal acceleration of rotating particles of the processed environment is many times higher. The centrifugal acceleration by up to 7000g and higher can be obtained. As a result the speed and level of crushing are higher.

2. Simultaneous processing of all volume of environment with big vibrations and velocity gradients inside the volume of environment. It leads to uniformity of processing of environment and increase of speed of processing in several times.
3. Absence of crushing bodies (spheres, cores, needles, etc.) and rotating bodies (blades, etc.), that leads to reduction of process cost and increase of cleanliness of a product, allows to create a highly effective mill for reception of micro powders.

4. The reactor does not rotate.

5. There is no emission of gas or liquid from the reactor.

6. A great speed of processing of environment.

7. Low power expenses for a unit of the processed environment.

8. Simplicity of maintenance.

9. Smaller sizes and smaller weight.
Successful results of our vortex-oscillatory technologies

(Received on laboratory installations)
1. Grinding of polymetallic ore

Polymetallic ore consisted of slices in the size of 1-8 mm. Ore grinding occurred within 15 minutes.

Results:
- The vortex was formed of this ore on laboratory installation.
- There was a grinding of ore and fractions of the micron size were obtained.

Recommendations about use of our technologies:
- Intensity of processing (level of accelerations of vibrations, speed of rotation, centrifugal acceleration) can be increased several times.
- Our devices can be applied in industrial grinding of materials (ore, etc.)
2. Sand grinding

Sand consisted of slices in the size of 1-3 mm. Sand grinding occurred within 15 minutes.

Result:
- The vortex was formed of this sand on laboratory installation.
- There was a grinding of sand and fractions of the micron size were obtained.

Recommendations about use of our technologies:
- Intensity of processing (level of accelerations of vibrations, speed of rotation, centrifugal acceleration) can be increased several times.
- Our devices can be applied in industrial grinding of materials (sand, ore, etc.)
3. Grinding of old cement

The cement which has been hardened in bags at long period of time was used. The hardened cement was preliminary broken into slices in the size of 1-5 mm. Grinding of slices of cement occurred within 15 minutes.

Result:
- The vortex was formed of these slices of cement on laboratory installation.
- There was a grinding of packed cement and fractions of the micron size were obtained.

Recommendations about use of our technologies:
- Intensity of processing (level of accelerations of vibrations, speed of rotation, centrifugal acceleration) can be increased several times.
- Our devices can be applied in industrial grinding (recovery) of packed cement.
- Our devices can be applied in increase of mark of cement before its use on concrete knots.
4. Grinding of beaten glass of luminescent lamps

The luminescent lamp subject to recycling was preliminary broken into slices (almost flat slices) in the size 1-10 mm. Grinding occurred within 15 minutes.

Result:
- The vortex was formed of these slices on laboratory installation (process occurred only at very intensive vortices).
- There was a grinding of glass and there were fractions of the micron size from glass and luminophor.

Recommendations about use of our technologies:
- Intensity of processing (level of accelerations of vibrations, speed of rotation, centrifugal acceleration) can be increased several times.
- Our devices can be applied in industrial grinding of glass and other waste.
5. Grinding of wood sawdust with water.

Wood sawdust in the size of 1-5 mm was used. The mix of sawdust with water in a mass parity 1:1 has been made. Process of grinding of sawdust in a water vortex occurred within 10 minutes and 20 minutes.

Result:
- The vortex was formed of this mix on laboratory installation.
- Grinding of sawdust was not observed.
Wood sawdust in the size of 1-5 mm was used. Process of grinding of sawdust in a vortex of sawdust (without water) lasted 20 minutes.

**Result:**
- The vortex was formed of dry sawdust on laboratory installation.
- Grinding of sawdust occurred, but the amount of sawdust with the micron size was very small.

**Recommendations about use of our technologies:**
- Intensity of processing (level of accelerations of vibrations, speed of rotation, centrifugal acceleration) can increase several times and achieve effective grinding of sawdust with the micron size.
- It will be possible to use up wood sawdust for preparation of biofuel, and for other purposes.
- It will be similarly possible to obtain mixed fodders from a grain waste.
7. Grinding of sublimated beets

до

после
8. Grinding of eggshells
9. Grinding of limestone

до

после
10. Grinding of peat
## Financial Plan

<table>
<thead>
<tr>
<th>Name of the stage</th>
<th>Duration of the stage, months</th>
<th>Unit cost, million dollars</th>
<th>Quantity, pcs</th>
<th>Expenses, million dollars</th>
<th>Selling price per unit, million dollars</th>
<th>Revenues from sales, million dollars</th>
<th>Profit/ Loss, million dollars</th>
<th>Net profit/ loss, million dollars</th>
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</thead>
<tbody>
<tr>
<td>R&amp;D of mill</td>
<td>12</td>
<td>0</td>
<td>0</td>
<td>0,4</td>
<td>0</td>
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<tr>
<td>International marketing</td>
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<tr>
<td>Payment of patent</td>
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<tr>
<td>Production of the 1st batch of mill</td>
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<td>25</td>
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<td>0,017</td>
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<td>25</td>
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<td>150</td>
<td>125</td>
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<td>375</td>
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<td><strong>Total:</strong></td>
<td><strong>42</strong></td>
<td><strong>20 025</strong></td>
<td><strong>101</strong></td>
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<td><strong>499</strong></td>
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<td><strong>409</strong></td>
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</table>

### Profitability (ratio of net profit to all expenses), %

403

### The ratio of cost of R & D to the serial selling price of mill

13
The graph shows that investments in mill start paying off from 18 months from the beginning of investment in R&D. Profit after 3.5 years will be around 375 million dollars.
Our offers

We search for the investor and the partner for working out of highly effective technological devices of new generation:

1. A mill for grinding various materials.

2. Processing of a household waste

We can develop installations on grinding of a household waste till the micron size.

We are ready to develop and make under your order a mill or another technological device of new generation on the basis of use of vortex oscillatory effect for development of serial release and for entering the international market.
Grinder of a material (Mill)

On an installation input small crushed material (1-10 mm) should be submitted. Material will be self-grounded till the micron size.

Grinding occurs due to simultaneous influence on a material of very intensive vibration, the big centrifugal acceleration and material whirl. Moving bodies (screws, mills, etc.) or spheres are not required. The reactor does not rotate. The material rotates by means of oscillations.

Grinding will occur simultaneous in all volume (stagnant areas are absent). Grinding process can be discrete and continuous. The reactor can be opened or tight. Grinders can be applied in all branches of industry.
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