Jigging

Baum Jig and Variable-Wave Jig
Stream

Jigging

stratification

The particle of low specific gravity

The particle of high specific gravity
PRINCIPLE OF JIG

① Water level
② Coal
③ Screen plate
④ Piston
# Air pulsator Jig

<table>
<thead>
<tr>
<th>Concentration</th>
<th>Baum Jig</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Takabu Jig 、Batac Jig</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Air valve</th>
<th>Piston valve</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Rotary valve</td>
</tr>
<tr>
<td></td>
<td>Flat valve</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Discharge device</th>
<th>Slide gate, Rotation gate, Swan cock</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Star foil</td>
</tr>
</tbody>
</table>
Difference of Concentration

Baum Jig

Front chart

- Compress air
- Swan cock
- Extraction air room
- Gate board
- Screen
- Float
- Bucket
- Elevator

Side chart

- Raw Coal
- Vibrating feeder
- Floor side
- Refuse

Refer to another chart.

BatAC Jig (Fane size)

- Air adjustment device
- Air exhaust pipe
- Middling
- Clean Coal
- Air supply pipe
- Air room
- Water pipe
- Refuse
- Supplying coal

Water supply
Advantage of Jig

- The processing performance is high for space required for installation.
- The range of the application particle size is wide.
- Simple structure.
- Low-cost
Disadvantage of Jig

- Strict separation accuracy cannot be expected.
- Volumes of water are used.
  
  (water processing cost)
De Slime Screen for raw coal
Magnet catcher
Primary Baum Jig
Restrictor of Jig

- Process of stratification
  Amount of supply coal and water supply, Blast volume and Pulse frequency
- Discharge refuse Process
  Specific gravity float, Slide gate, Rotary gate, Swan cock and Star wheel
<table>
<thead>
<tr>
<th>Factor Type</th>
<th>Factors</th>
</tr>
</thead>
<tbody>
<tr>
<td>Row Coal</td>
<td>Specific gravity distribution, Grain degree and Shape</td>
</tr>
<tr>
<td>Washing water</td>
<td>Specific gravity and Pulverized coal density</td>
</tr>
<tr>
<td>Amount of coal Supply</td>
<td>Area of screen</td>
</tr>
<tr>
<td>Air</td>
<td>Air pressure and air volume</td>
</tr>
<tr>
<td>Pulse frequency</td>
<td>Wave height and Progress speed</td>
</tr>
<tr>
<td>Rejection refuse</td>
<td>Accuracy of sensor and Response</td>
</tr>
</tbody>
</table>
Coal supply

• Supplying coal equally to the feeder
• Hardening is not and has gotten untied.

(It influences the concentration accuracy somewhat of the amount of coal supply. )

Excessive supply → High bed → Movement speed down
→ accuracy down

Underestimated supply → Low bed → Stratification depression
→ accuracy decrease
Coal feeder (vibrating feeder)
Feeder control panel
Water supply

• When the amount of water supply is large
  stream is fast
    → The minute grain selection is defective.
        (The surface flow velocity grows. )
• When the amount of the water supply is a little
  stream is late
    → Decentralization is defective.
    → The washing is difficult
Head Tank

Overflow pipe

Supply pipe

Supply water to jig
Adjusting valve
Flow meter
Water pipe
Supply water to jig
Difference of air valve

Piston valve

Rotary valve

Flat valve
Compressor
Air amount meter
Pulse frequency

- Progress speed of bed
- Upper layer of bed
  The progress speed is fast, and the pulse frequency that the particle receives is a little.
- Lower layer of bed
  The pulse frequency that the particle receives is abundant. slow the progress speed
# Difficulty degree of washing

<table>
<thead>
<tr>
<th>±0.1Weight within the range of specific gravity (%)</th>
<th>Washing degree</th>
</tr>
</thead>
<tbody>
<tr>
<td>0~7</td>
<td>Easiness</td>
</tr>
<tr>
<td>7~10</td>
<td>Little difficult</td>
</tr>
<tr>
<td>10~15</td>
<td>Difficulty</td>
</tr>
<tr>
<td>15~20</td>
<td>Extremely difficult.</td>
</tr>
<tr>
<td>20~25</td>
<td>Specially extremely difficult</td>
</tr>
<tr>
<td>25以上</td>
<td>Possible to hardly select it</td>
</tr>
</tbody>
</table>
Subsidence of particle

- Natural subsidence
- Compulsion subsidence
- Hindered settling
Rejection refuse mechanism

- Sensor
  - Float
- Rejection refuse opening
  - Slide gate
- Rejection refuse mechanism
  - Rotation gate and Swan cock
  - Star foil
Automatic rejection refuse device

- Height measurement
- Supersonic wave transmitter
- Height of bed \( h_1 \)
- Coupling rod
- Guide roller
- Float
- Floor Screen
- Floor Screen
- 3rd Vessel
- 4th Vessel
- Weir for overflow
- Exhaust back pressure
- Swan cock
- Slide gate
- Rotation gate
- Shelf for rejection refuse
### The measurement of Float Specific Gravity

<table>
<thead>
<tr>
<th></th>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>a</td>
<td>Float Volume</td>
<td>4238 CC</td>
</tr>
<tr>
<td>b</td>
<td>Float Weight</td>
<td>1,855 g</td>
</tr>
<tr>
<td>c</td>
<td>Coupling rod Attachment lug</td>
<td>266 g</td>
</tr>
<tr>
<td>d</td>
<td>Coupling rod</td>
<td>1,869 g</td>
</tr>
<tr>
<td>e</td>
<td>Reflector</td>
<td>154 g</td>
</tr>
<tr>
<td>f</td>
<td>Reflector Attachment lug</td>
<td>403 g</td>
</tr>
<tr>
<td>g</td>
<td>Sand Weight in the Float</td>
<td>1,154 g</td>
</tr>
<tr>
<td>h</td>
<td>Weight Sub total ((b+c+d+e+f+g))</td>
<td>5,721 g</td>
</tr>
<tr>
<td>i</td>
<td>Specific Gravity (\frac{h}{a})</td>
<td>1.35</td>
</tr>
<tr>
<td>J</td>
<td>Weight for adjustment</td>
<td>551 g</td>
</tr>
<tr>
<td>k</td>
<td>Weight Total ((h+k))</td>
<td>6272 g</td>
</tr>
<tr>
<td>l</td>
<td>Specific Gravity for operation (\frac{k}{a})</td>
<td>1.48</td>
</tr>
</tbody>
</table>

**Diagram:**
- **a:** Float
- **b:** Float
- **c:** Coupling rod
- **d:** Coupling rod
- **e:** Reflector
- **f:** Reflector
- **g:** Reflector Attachment lug
- **h:** Weight for adjustment
- **i:** Weight Total
- **j:** Weight for adjustment
- **k:** Weight for operation
- **l:** Specific Gravity for operation

**Image:**
- Float close up
- The measurement of Float Specific Gravity
- Diagram showing the float components and their respective weights.
Rotation gate
Motor

Swan cock
Bucket elevator

Measuring the volume in the bucket
Vari-wave Jig
(Variable-Wave Jig)

• The shape of waves and the pulse frequency can be easily set.
  Improvement of selection accuracy
  Stability of bed
  An increase in amount of processing
Baum Jig and Variable-Wave Jig

Diagram showing components such as:
- Compress air
- Rejection refuse
- Screen
- Trestle
- Wave high sensor
- Gate
- Exhause
- Silencer
- Air room
- Float
- Swan cock

Diagram illustrates flow and interaction of these components.
Variable-Wave Jig

- High pressure air
- Low pressure air
- Exhaust
- Silencer
- Air chambers
- Frame
- Wave height sensor
- Slide gate screen discharge devices
- Frame
- Coal
- Refuse
- Middling
- Clean coal
Difference Rejection refuse device

Automatic rejection refuse device

Refuse level transmitter (float)

Automatic rejection refuse device

The upper surface of water tank

Magnet

Magnetostriiction sensor

Controller

Guide roller

Automatic rejection refuse device

Flore screen

Star foil

Slide gate, rotation gate, and Swan cock

Star foil
Externals of Variable-wave jig
Refuse level transmitter (float)

Automatic rejection refuse device
Cycle time port line chart

(insertion and comparison at exhaust cycle between jig and Vari-Bali wave jig in the past)

Wavy pattern 1 in the past (Palsation 44.7 rpm/min)

Variabul-wave form pattern 5 (Palsation 40.0 rpm/min)
FLAT VALVE
Height of wave sensor
Wavy comparison

Wavy comparison between existing jig and Vari-wave jig

**Existing jig (sine wave type)**

![Graph of Existing Jig](image1)

**Vari-wave jig (trapezoid wave type)**

![Graph of Vari-wave Jig](image2)
Actual wavy graph

No1 tank air room side

No1 tank operation room side

No2 tank air room side

No2 tank operation room side
Control board of variable wave jig

Height of refuse bed

Touch panel

Wave monitor
Magnet Catcher