• Vecoplan built their first machine in 1969
• Vecoplan built their first machine in 1969

• Vecoplan developed the first single-shaft vertical grinder in 1982
• Vecoplan built their first machine in 1969

• Vecoplan developed the first single-shaft vertical grinder in 1982

• Vecoplan currently sells over $140 million annually of single-shaft units worldwide.
  • 50 million in the USA
Vecoplan Carpet Installations
Complete carpet recycling plant by Vecoplan
Quantity of carpet recycled by Vecoplan
190 Vecoplan / ReTech machines processing carpet
190 Vecoplan / ReTech machines processing carpet
× 4000 average lbs/hr per machine
190 Vecoplan / ReTech machines processing carpet
x 4000 average lbs/hr per machine
x 2000 average hours or operation per year
Vecoplan Complete System Integration

190 Vecoplan / ReTech machines processing carpet
\[ \times 4000 \text{ average lbs/hr per machine} \]
\[ \times 2000 \text{ average hours or operation per year} \]

\[ = 1.5 \text{ BILLION} \]

pounds of carpet per year
processed on Vecoplan / ReTech equipment
Primary ReTech Shredders Used for Carpet Recycling

Vecoplan
The Ultimate Shredding Machine

ReTech Rotary Grinders by Vecoplan
• RG52 - 52” x 58” - 1500-3000 lbs/hr.
- **RG52** - 52” x 58” - 1500-3000 lbs/hr.

- **RG62** - 63” x 80” - 4000-6000 lbs/hr.
- **RG52** - 52” x 58” - 1500-3000 lbs/hr.
- **RG62** - 63” x 80” - 4000-6000 lbs/hr.
- **RG70** - 70” x 80” - 8000-10,000 lbs/hr.

Vecoplan - The Ultimate Shredding Machine

ReTech Rotary Grinders by Vecoplan
• RG52 - 52” x 58” - 1500-3000 lbs/hr.
• RG62 - 63” x 80” - 4000-6000 lbs/hr.
• RG70 - 70” x 80” - 8000-10,000 lbs/hr.
• RG78 - 78” x 98” - 10,000-12,000 lbs/hr.
- **RG52** - 52” x 58” - 1500-3000 lbs/hr.
- **RG62** - 63” x 80” - 4000-6000 lbs/hr.
- **RG70** - 70” x 80” - 8000-10,000 lbs/hr.
- **RG78** - 78” x 98” - 10,000-12,000 lbs/hr.
- **RG98** - 98” x 98” - 16,000-18,000 lbs/hr.
Rotating End Discs
Rotating End Discs

- Reduce heat generation
Rotating End Discs

- Reduce heat generation
- Reduce sidewall wear
Rotating End Discs

- Reduce heat generation
- Reduce bearing contamination
- Reduce sidewall wear
Rotating End Discs

- Reduce heat generation
- Reduce sidewall wear
- Reduce bearing contamination
- Reduce fines
SureCut™ Fiber Processing System

Vecoplan
The Ultimate Shredding Machine

ReTech
Rotary Grinders by Vecoplan
The Director of the United States Patent and Trademark Office

Has received an application for a patent for a new and useful invention. The title and description of the invention are enclosed. The requirements of law have been complied with, and it has been determined that a patent on the invention shall be granted under the law.

Therefore, this

United States Patent

Grants to the person(s) having title to this patent the right to exclude others from making, using, offering for sale, or selling the invention throughout the United States of America or importing the invention into the United States of America for the term set forth below, subject to the payment of maintenance fees as provided by law.

If this application was filed prior to June 8, 1995, the term of this patent is the longer of seventeen years from the date of grant of this patent or twenty years from the earliest effective U.S. filing date of the application, subject to any statutory extension.

If this application was filed on or after June 8, 1995, the term of this patent is twenty years from the U.S. filing date, subject to any statutory extension. If the application contains a specific reference to an earlier filed application or applications under 35 U.S.C. 120, 121 or 365(c), the term of the patent is twenty years from the date on which the earliest application was filed, subject to any statutory extensions.

Director of the United States Patent and Trademark Office

United States Patent

Shredder

Inventor: Thomas Sturm, Zelaznokos (DE)

Assignee: Vemoplan Maschinenfabrik GmbH & Co. KG, Bad Münstereifel (DE)

Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 208 days.

Appl. No.: 10/734,359
Filed: Dec. 28, 2002

Prior Publication Data

US 2005/018971 A1 Jan. 12, 2005

Int. Cl.?: B26B 11/28

Field of Search: 241/243, 241/294

References Cited

U.S. Patent Documents

1,234,567 A * 10/93 Smith
1,345,678 A * 11/1984 Davis

FOREIGN PATENT DOCUMENTS

DE 39 32 345 C2 2/1993

* cited by examiner

Primary Examiner—Daniel C. Cane

(54) ABSTRACT

A rotary shredder for shredding various materials including fibrous materials, comprising at least one rotor that carries a plurality of V-cutters axially spaced apart along the rotor to mesh with recesses between adjacent teeth of a counter knife. The rotor also carries a plurality of flat cutters. Each flat cutter has a cutting edge that is parallel to the axis of the rotor. The flat cutters are aligned in the axial direction with the teeth of the counter knife, and hence are axially positioned between axially adjacent V-cutters. The flat cutters are positioned to work in conjunction with the counter knife so to cut material that accumulates between adjacent V-cutters.

19 Claims, 3 Drawing Sheets

H://Leihung_Technik/Patenten/Fasermotor VAZ/US Patent FF-Rotor.doc

02-02-05 TST
The Director of the United States Patent and Trademark Office

The United States of America

Patented in January, 2005
Patented in January, 2005

Eliminates rotor wrapping
Patented in January, 2005

Eliminates rotor wrapping

Eliminates screen blinding if a screen is used
- Patented in January, 2005
- Eliminates rotor wrapping
- Eliminates screen blinding if a screen is used
- Reduces cut size
Patented in January, 2005

Eliminates rotor wrapping

Eliminates screen blinding if a screen is used

Reduces cut size

Increases fiber separation
- Patented in January, 2005
- Eliminates rotor wrapping
- Eliminates screen blinding if a screen is used
- Reduces cut size
- Increases fiber separation
- Lowers required horsepower
Patented in January, 2005

Eliminates rotor wrapping

Eliminates screen blinding if a screen is used

Reduces cut size

Increases fiber separation

Lowers required horsepower

Lifetime warranty
Shredder Control Panels
That Actually Give You...CONTROL!
The Revolutionary Rev 9-A Control Panel from Vecoplan
Gives You Complete Control Of Your Fiber Processing!

- Allen-Bradley Micrologix 1500 PLC
- Allen-Bradley VersaView HMI
- Exclusive Self-Commissioning Feature
- Customizable Program Setting
- Self-Diagnostic Features
- Exclusive VFD Ram Control
HiTorc™ Drive

- Synchronous AC Motor
- Permanent Magnet
- 24 Poles
- 100% torque over full range of speed

**Torque Characteristics**

- Torque of Vecoplan HiTorc
- Torque of conventional drive
Useable Speed Range of Vecoplan HiTorc

- 30 - 300 rpm speed range

- Torque of Vecoplan HiTorc
- Torque of conventional drive

200% useable speed range
• 100% torque over full range of speed

• 30 - 300 rpm speed range

• Start / stop immediately
• Significantly lower current draw

Current Draw and Efficiency of Vecoplan HiTorc

- 300% torque with approx. 300% FLA
- The maximum current (and torque) can be limited according to rating of electrical service

Legend:
- Red: Current of Conventional Drive
- Blue: Torque of Vecoplan HiTorc
- Green: Current of HiTorc Drive
- Amp draw comparison - 100 HP drive

### POWER CONSUMPTION COMPARISON

<table>
<thead>
<tr>
<th>Description</th>
<th>Standard RG52</th>
<th>RG52 w/HiTorc</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Vecoplan Shredder Running Empty:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Start Up Amperage Load -</td>
<td>1,200 amps +</td>
<td>103 amps</td>
</tr>
<tr>
<td>Free Running Amperage Load -</td>
<td>50 amps +/-</td>
<td>9 amps</td>
</tr>
<tr>
<td><strong>Vecoplan Shredder Operating Under Load:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Start Up Amperage Load -</td>
<td>1,067 amps</td>
<td>158 amps</td>
</tr>
<tr>
<td>Highest Amperage Spike (Peak Demand) -</td>
<td>994 amps</td>
<td>264 amps</td>
</tr>
</tbody>
</table>
- **Power savings comparison - 200 HP drive**

**ENERGY SAVINGS COMPARISON**

Actual *MONTHLY* Operating Costs for an existing Vecoplan customer, as estimated by their local power company

<table>
<thead>
<tr>
<th></th>
<th>Standard RG70</th>
<th>RG70 w/HiTorc</th>
</tr>
</thead>
<tbody>
<tr>
<td>Customer Charge</td>
<td>$16.24</td>
<td>$16.24</td>
</tr>
<tr>
<td>Demand Charge</td>
<td>$369.39</td>
<td>$37.00</td>
</tr>
<tr>
<td>Energy Charge</td>
<td>$1,950.36</td>
<td>$246.79</td>
</tr>
<tr>
<td>Fuel and Purchased Power</td>
<td>$337.74</td>
<td>$61.24</td>
</tr>
<tr>
<td>Muni Franchise Fee</td>
<td>$139.03</td>
<td>$19.47</td>
</tr>
<tr>
<td><strong>Total Meter Charges</strong></td>
<td><strong>$2,812.76</strong></td>
<td><strong>$380.74</strong></td>
</tr>
<tr>
<td>State Sales Tax</td>
<td>$168.76</td>
<td>$22.84</td>
</tr>
<tr>
<td>County Sales Tax</td>
<td>$28.13</td>
<td>$3.80</td>
</tr>
<tr>
<td>City Sales Tax</td>
<td>$14.06</td>
<td>$1.90</td>
</tr>
<tr>
<td><strong>Totals</strong></td>
<td><strong>$3,023.71</strong></td>
<td><strong>$409.28</strong></td>
</tr>
</tbody>
</table>
- 100% torque over full range of speed
- 30 - 300 rpm speed range
- Start / stop immediately
- Significantly lower current draw
- Low maintenance
• 100% torque over full range of speed
• 30 - 300 rpm speed range
• Start / stop immediately
• Significantly lower current draw
• Low maintenance
• Low noise
- 100% torque over full range of speed
- 30 - 300 rpm speed range
- Start / stop immediately
- Significantly lower current draw
- Low maintenance
- Low noise
- 5-year warranty
Optional Equipment and System Services

Vecoplan
The Ultimate Shredding Machine

ReTech Rotary Grinders by Vecoplan
• Vecoplan complete system integration
Vecoplan KKF Conveyors
Vecoplan KKF Conveyors

- Multiple Elevation Changes
Vecoplan KKF Conveyors

- Multiple Elevation Changes
- Multiple Drop Points - PLC Controlled
Vecoplan KKF Conveyors

• Multiple Elevation Changes
• Multiple Drop Points - PLC Controlled
• Totally Enclosed
• Dust Free Operation
• System engineering and manufacturing
• Dust control and fines separation systems
• Airspring bedknife for self clearing
• Water-cooled rotor and/or cutting chamber
• Different size and metal compositions for cutters