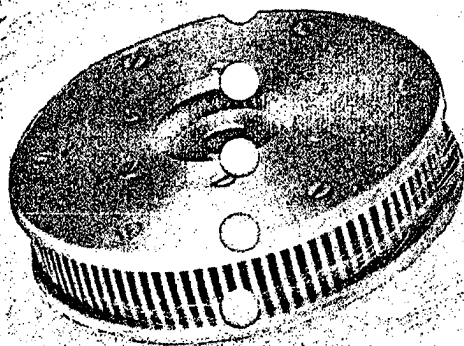
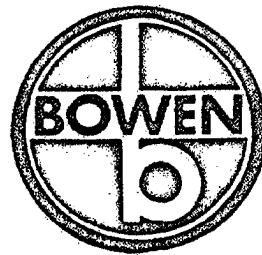


● the
● BOWEN
● SPRAY
● MACHINE
● and
● CENTRIFUGAL
● ATOMIZER
● WHEELS



**ENGINEERED
FOR
CONTROLLED
ATOMIZATION**



**BOWEN ENGINEERING
INC.**

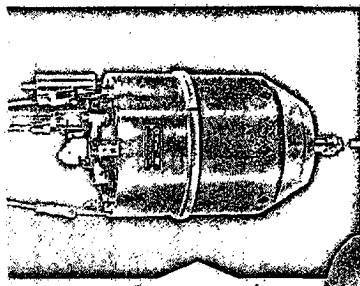
North Branch, New Jersey

Recognized Leader in Spray Drying Since 1926

Bulletin No. 51

BOVEN AND THE WHEELS

The Boven line of patented stamper wheels includes a variety of basic wheel types—all with sub-type design modifications—that are carefully selected for each specific application to meet precise requirements of average product particle size, particle size distribution, bulk density and other product characteristics. Although normally made of stainless steel, Boven stamper wheels can be manufactured using other special metals and alloy-bronze, can be furnished to handle practically any corrosive or abrasive feed. Multiple stamper wheels are available for high production capacity operations.



...exclusively for use with Boven Spray Dryers

Unique, yet simple in design, the Boven Spray Machine is a compact, self-contained unit for rapid, rugged, high-speed operation. Its power is provided by a built-in high speed motor, ruggedly mounted on a cast-iron base. A corrosion-resistant feed pipe passes through the housing to deliver feed material to a rapidly spinning stamper wheel directly mounted on the motor shaft. High frequency current for easy conversion set which can be remotely located out of hot, dusty and otherwise hazardous areas. Frequency can be readily selected to provide any desired stamper wheel speed between 4,000 and 24,000 rpm.

Boven CME Stamper. In contrast to the disc with sharp peripheral edge. Atomization is effected by the high abrasion action over this edge. This is a relatively inexpensive stamper often used where replacement cost is of major importance.

Boven CME Stamper. In contrast to the disc type, has rounded edge that provides less abrasion and better control of particle size. More uniform product characteristics are comparable to the CSE.

Boven V Type Stamper. Capable of curved feed material, the V type stamper may be either forward or backward leading. Atomization comes principally from the flow of material over the edges of the vases as compared to the flow over the periphery of the disc on the CSE and CME Stamper.

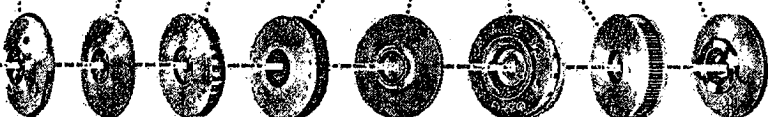
Boven Pin-Type Stamper. is used principally for atomization of abrasive feeds. Many of its applications involve high capacity production operations.

Boven DH Stamper. finds important use in instances where a high degree of particle size uniformity is mandatory. Variations are controlled by changing the diameter and number of the holes.

Boven DH Stamper. is a modification of the DH type, designed for use with highly abrasive feeds. It is used for atomizing highly-abrasive materials.

Boven B Type Stamper. is designed to accomplish the maximum degree of atomization. It is used where maximum particle size or desired, in which case it accomplishes improved drying rates. It may also be used to handle high viscosity feeds requiring a high degree of atomization.

Boven M/CNE Stamper. is typical of the Boven multiple stamper designs which are available in many of the above types. These multiple stamper designs are used for high capacity spray drying operations.



Superior Features

1. **Simple design.** The Boven Spray Machine is a compact, self-contained unit for rapid, rugged, high-speed operation. Its power is provided by a built-in high speed motor, ruggedly mounted on a cast-iron base. A corrosion-resistant feed pipe passes through the housing to deliver feed material to a rapidly spinning stamper wheel directly mounted on the motor shaft. High frequency current for easy conversion set which can be remotely located out of hot, dusty and otherwise hazardous areas. Frequency can be readily selected to provide any desired stamper wheel speed between 4,000 and 24,000 rpm.

2. **High capacity.** The Boven Spray Machine is designed for high capacity production operations. It is capable of handling feeds of varying viscosity and particle size. The multiple stamper design allows for high capacity atomization.

3. **Uniform product.** The Boven Spray Machine is designed to produce uniform product characteristics. The multiple stamper design allows for uniform atomization and drying.

4. **Easy maintenance.** The Boven Spray Machine is designed for easy maintenance. The multiple stamper design allows for easy replacement of stamper wheels.

5. **Wide range of application.** The Boven Spray Machine is designed for a wide range of applications. It is used for atomizing a variety of feeds, including abrasive feeds, high viscosity feeds, and feeds requiring high capacity atomization.

6. **Compact design.** The Boven Spray Machine is a compact, self-contained unit. It is easy to install and operate.

7. **Rugged construction.** The Boven Spray Machine is built with rugged construction. It is capable of handling feeds of varying viscosity and particle size.

8. **High speed operation.** The Boven Spray Machine is designed for high speed operation. It is capable of handling feeds of varying viscosity and particle size.

Atomization is the heart of the spray drying process. It is the means by which high liquid surface-to-surface ratios are attained in order to achieve the extremely rapid rates of evaporation essential to an efficient spray drying operation. Three methods of atomization are commonly employed—each having its place in adapting the spray drying process to the material being dried. The Boven Spray Machine is designed to handle the problems encountered in drying chemical, ceramic and food products to produce quality specifications.

PRESSURE ATOMIZATION. Here, atomization energy is provided by fluid pressure. Liquid feed material is introduced to the spray dryer under high pressure through specially-designed nozzles. This method is used in drying feeds of high viscosity, high bulk density, and feeds requiring high capacity atomization. Variations in product characteristics may be obtained by changing nozzle designs and operating pressure.

Centrifugal Atomization. This method utilizes the energy of centrifugal force to atomize solutions, gels or slurries. It does not require high pumping pressures. A rapidly spinning wheel accelerates and atomizes the feed material into fine droplets that leave the wheel at speeds ranging from 150 to 450 mph. The resulting impact of the feed against the drying air atomizes both low and high viscosity materials into a dryable mist.

Pressure Nozzle Atomization. Sometimes called two-fluid nozzle atomization, this method combines the energy of fluid pressure with the energy of centrifugal force. The Boven Spray Machine's patented nozzle design is particularly well suited for handling abrasive feeds. Generally, this method is limited to low production capacity operations.

Boven offers spray dryer designs utilizing the three different basic types of atomization—thus, can furnish the one best suited for any given drying requirement. The Boven Spray Machine is designed to handle feeds of varying viscosity and particle size. The multiple stamper design allows for high capacity atomization and drying.

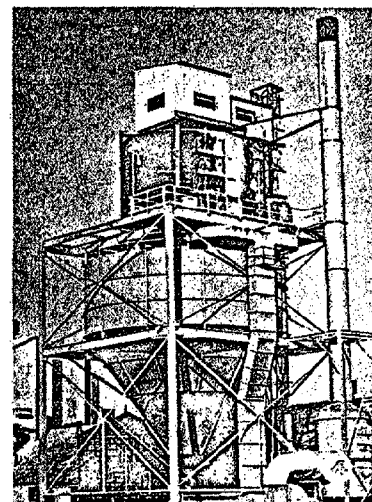
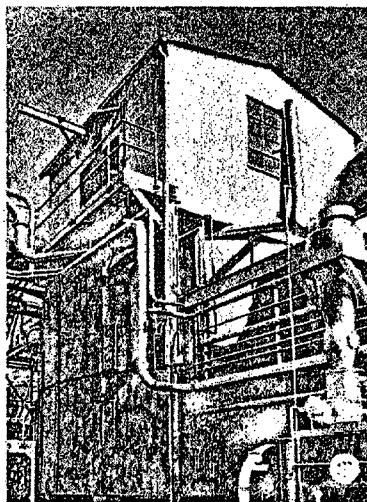
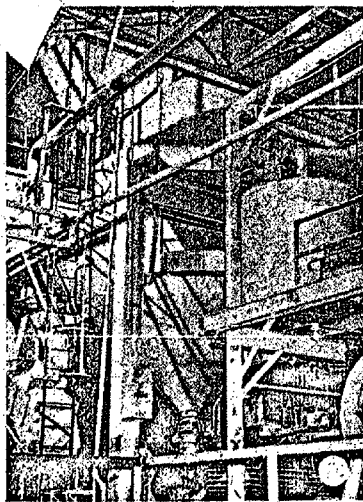
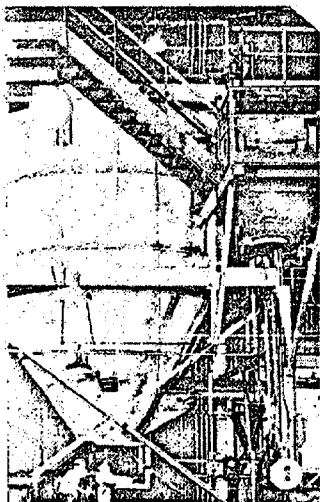
- 1—Any high or low viscosity feed material that is pumpable can be effectively atomized—whether solution, emulsion, dispersion or slurry.
- 2—Selected production rate—from virtually zero to maximum design capacity—is controlled directly by rate of feed and may be altered without any perceptible change in finished product characteristics.
- 3—Particle size—a most important product characteristic—can be selectively controlled over a broad size range by easily made adjustments in stamper wheel speed.
- 4—Further control can be exercised over particle size—and also, over particle size distribution, bulk density and other important product characteristics—through the use of readily interchangeable stamper wheels of varying design.

A FEW
OF THE
MANY

BOWEN
CENTRIFUGAL
SPRAY DRYER
INSTALLATIONS
in operation
throughout
the world

THE BENEFITS OF MODERN SPRAY DRYING

- Continuous Automatic Processing
- Minimum Labor Requirement
- Improved Product Quality
- Lower Operating Costs
- Great Operating Flexibility
- Uniform Free-flowing Product
- Less Product Waste
- Process Steps Eliminated
- Reduced Overhead
- Lower Maintenance Costs
- Minimum of Moving Parts



1. Sixteen-foot diameter spray dryer used by major manufacturer of electronic ceramics for drying ferrites. 2. Large 32-foot diameter spray dryer used by leading manufacturer for producing high alumina particles for spark plug bodies. 3. Flat-bottom, 25-foot spray dryer with air sweeper used by large chemical company for drying heat-sensitive resins. 4. Bowen 24-foot spray dryer used to produce dust-free chemical. Unit is superimposed on top of settling chamber and product is discharged at base.

Bowen Spray Dryers
are available for
laboratory, pilot
plant and medium
to high tonnage
production
applications.

- No Product Attrition
- Cleaner Operation
- Precise Product Control
- Short Retention Time
- Safe for Heat-sensitive Materials

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INC.**

North Branch, New Jersey