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UNION CARBIDE
THE DISCOVERY COMPANY

Calidria ASBESTOS

UNION CARBIDE CORPORATION • MINING & METALS DIVISION • P.O. BOX 579 • NIAGARA FALLS, N. Y. 14302 • TEL: 716-278-3376

PLAINTIFF'S EXHIBIT
UC-3652

CALIDRIA "PELLETIZED SG-210"

FOR READY-MIX TAPE JOINT COMPOUNDS

UNION CARBIDE CORPORATION
MINING AND METALS DIVISION
NIAGARA FALLS, NEW YORK

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CALIDRIA "PELLETIZED SG-210"

FOR READY-MIX TAPE JOINT COMPOUNDS

INTRODUCTION

Over the past several years, "Calidria" asbestos SG-210 has become widely established as the preferred form of asbestos for the manufacture of ready-mix tape joint compounds. The high fiber content of this well-refined asbestos permits a substantial reduction in the quantity of asbestos needed in typical formulations. Its fine grind and uniform quality give a whiter, smoother mud with consistent properties from batch to batch.

Users of the various types of ground or "powdered" asbestos are well aware of the new occupational safety and environmental regulations which require careful control of airborne asbestos dust levels. They are also aware of the energy shortage and its effects on transporation costs. As a means to minimize the impact of these problems, Union Carbide is introducing a pelletized version of SG-210, specifically designed for use in tape joint compounds.

The pellets, about 1/4" in diameter and 3/8" long, are shown below in comparison with ground asbestos. The pellets are free-flowing and can be handled and metered in conventional solids handling equipment. Dust levels will obviously be sharply reduced or essentially eliminated.



Ground Asbestos Pelletized Asbestos

The bulk density of the pellets is 45 pounds per cubic foot or about three times that of SG-210. A carload contains 120,000 pounds which results in a freight savings in the range of 0.6-1.0 cents per pound depending on destination. Bulk carloads of 180,000 pounds are available at further savings if the usage is sufficiently large to justify the storage facilities.

The advantages of reduced freight costs and lower dust generation of the pelletized form of asbestos are partially offset by one problem, i.e., the mixing equipment ordinarily used to blend tape joint compounds does not have

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enough shear to open the pellets completely. It is thus necessary to add a pellet feeder, a small high-shear wet mixing device, and a means to transport the slurry from the mud mixer to the processing sequence. It is estimated that a capital expenditure in the range of $4,000-10,000 would be required to provide this equipment. It is also well known that the order of addition of ingredients can effect the mud properties. Some rebalancing of the formulation may be required.

At the present time, pelletized "Calidria" asbestos is widely used in the manufacture of vinyl-asbestos floor tile and in certain grades of paper. Extensive experience is available on pellet handling and the preparation of asbestos slurries. Union Carbide is also prepared to provide slurry samples for testing and several "repulpers" are available for extended loan for in-plant use. We are not, however, in a position to provide complete mud formulations and must rely on you for this. This report, therefore, summarizes the concept, indicates the economies, and provides additional background information to help you assess how pellets might fit into your manufacturing operation. We feel that pellets are the way of the future and stand ready to assist wherever possible in your evaluation of this new approach to asbestos use.

PELLET OPENING

A schematic diagram of one equipment arrangement of a "pellet repulper" is shown in Figure 1. One pallet of 40 bags (2000 lbs.) of pelletized asbestos is dumped into a feed hopper. This quantity can easily be dumped in 10-20 minutes and in a typical installation is about a day's supply of asbestos. The pellets have a bulk density of about 45 pounds per cubic foot so the hopper would be only about 3 feet square and 6 feet high.

When asbestos is needed, the pellets are moved by a screw or vibratory feeder into the top of a small impact mill. Water is fed simultaneously to the mill at a controlled rate to give a slurry of about 5% solids. The slurry drops into a holding tank. One hundred pounds of asbestos in a 5% slurry will require about a 250 gallon tank. At the start of each mud blend, the required amount of slurry is pumped over to the mud mixer.

Once the pellet hopper is loaded, the entire slurry preparation can be operated very easily by remote push-button control or by automatic cycle timer. The pellets flow freely from the bottom of the feed hopper. They are virtually dust free but the feeder can be totally enclosed if desired.

This kind of equipment has been used commercially for the continuous preparation of slurry for feed to paper making systems. A photograph of a self-contained, portable pellet repulper is shown in Figure 2. A unit as small as this with a 10-15 H.P. Fitz or Reitz mill can open 200-900 pounds per hour of pellets. It would thus operate only a moderate portion of the time in tape joint compound manufacture. This particular unit is intended for continuous operation and has a smaller sump than indicated in the schematic layout of Figure 1. It is estimated that the total cost of a repulper setup of this general type is $5,000-10,000.

There are obviously a number of other ways to arrange the slurry opening equipment. The mill could discharge directly into the mud mixer and eliminate the slurry hold tank. Slurry would enter the mixer over roughly a 10-minute period

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while the other dry ingredients were added simultaneously. If bagged pellets are used, the size of the hopper could also be reduced and two or three bags could be dumped manually for each batch of mud.

FORMULATING WITH CALIDRIA "PELLETIZED SG-210"

The maximum solids content for a repulper slurry is approximately 5% by weight. This is about the highest solids content in a well-opened slurry that can be pumped. If some part of the surfactant used in the formulation is introduced into the water to the mill, however, it is possible to attain several percent higher solids.

It is also well recognized that the order in which the ingredients are added can have a significant bearing on rheological properties of the mud. Mixing a specific tape joint formulation starting with an asbestos slurry may give a different mud than the one obtained when the same ingredients are dry blended and added together into the water in the mud mixer. For this reason, it is necessary to check and probably adjust your formulation to allow for the asbestos slurry base. Limited experience indicates that this is not a serious problem but it obviously must be checked for each formulation. Union Carbide is, therefore, prepared to supply, at your request, gallon and larger quantities of slurry, prepared in a repulper like that shown in Figure 2, for your use in checking formulations.

PELLET PACKAGING

"Calidria" asbestos pellets are packaged in 50-pound multiwall paper bags stacked 40 to a pallet. A carload is made up of 60 pallets for a total of 120,000 pounds. Pelletized asbestos is also available in 180,000-pound bulk hopper cars and is now being handled this way on a regular commercial basis. The pellets flow freely from the cars and can be moved by conventional pneumatic or mechanical equipment.

Asbestos usage at even the largest mud manufacturing plants may be too small to justify the investment in bulk asbestos facilities. If, however, bulk handling equipment is available for limestone or other large volume raw material, the incremental cost to apply it to the asbestos may be minimal.

In addition to these two "packages" Union Carbide is investigating the use of large, one-way bags containing 1000-2000 pounds each. These bags are typified by the St. Regis "Sling-Bins" for which illustrative literature is included in Appendix II. With the Sling-Bins, the Feed Hopper in Figure 2 would become the receptical for the large bag of pellets. It could be lowered in, the lid closed, and the bag opened by external control. With the pellets, the bag should drain clear of asbestos. We feel that this kind of material handling is the optimum for the usage levels typical of plants manufacturing tape joint compounds. Its adoption, however, will depend on the interest expressed by the end man who receives the package. For the immediate future, it is probably best to think in terms of the pellets in 50- or 100-pound bags.

ECONOMICS

"Pelletized SG-210" is priced the same as SG-210. The higher bulk density, however, allows substantial savings in freight. This saving ranges

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from 0.6 to 1.13¢/lb. for the 50-pound bags, depending on the part of the country to which the shipment is sent. This is illustrated in Table I. Bulk shipment provides additional savings of about 0.15¢/lb.

As a specific example of these figures, consider a tape joint compound manufacturing plant using 50,000 pounds of asbestos per month. At a freight saving of 1¢/lb., a $5,000 investment in repulping equipment would pay off in 10 months. It is important to realize that these figures do not include any credit for the substantial reduction in warehouse requirements, reduced dust levels that are characteristic of pelletized asbestos, and the potential saving in dust control equipment. Dust control could be the overriding factor in a decision to change to the use of pellets.

CONCLUSIONS

We feel that pelletized asbestos in the "Sling-Bin" type package is the efficient, economical "way of the future" for the asbestos usage rates typical of the tape joint manufacturing industry. The higher bulk density of the pellets keeps transportation, storage, and handling costs under control. Dust problems are greatly reduced and automatic operation is easy to achieve. A capital investment for "opening" equipment is needed but this is relatively modest and the freight savings of 0.6-1.0¢/lb. of asbestos give rapid payoff.

Union Carbide stands ready to supply you with technical consultation on pellet handling and opening. Typical asbestos slurries for checking your formulations can be provided easily and several portable repulpers are also available for loan for in-plant testing.

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SCHEMATIC DIAGRAM

PELLET OPENING EQUIPMENT

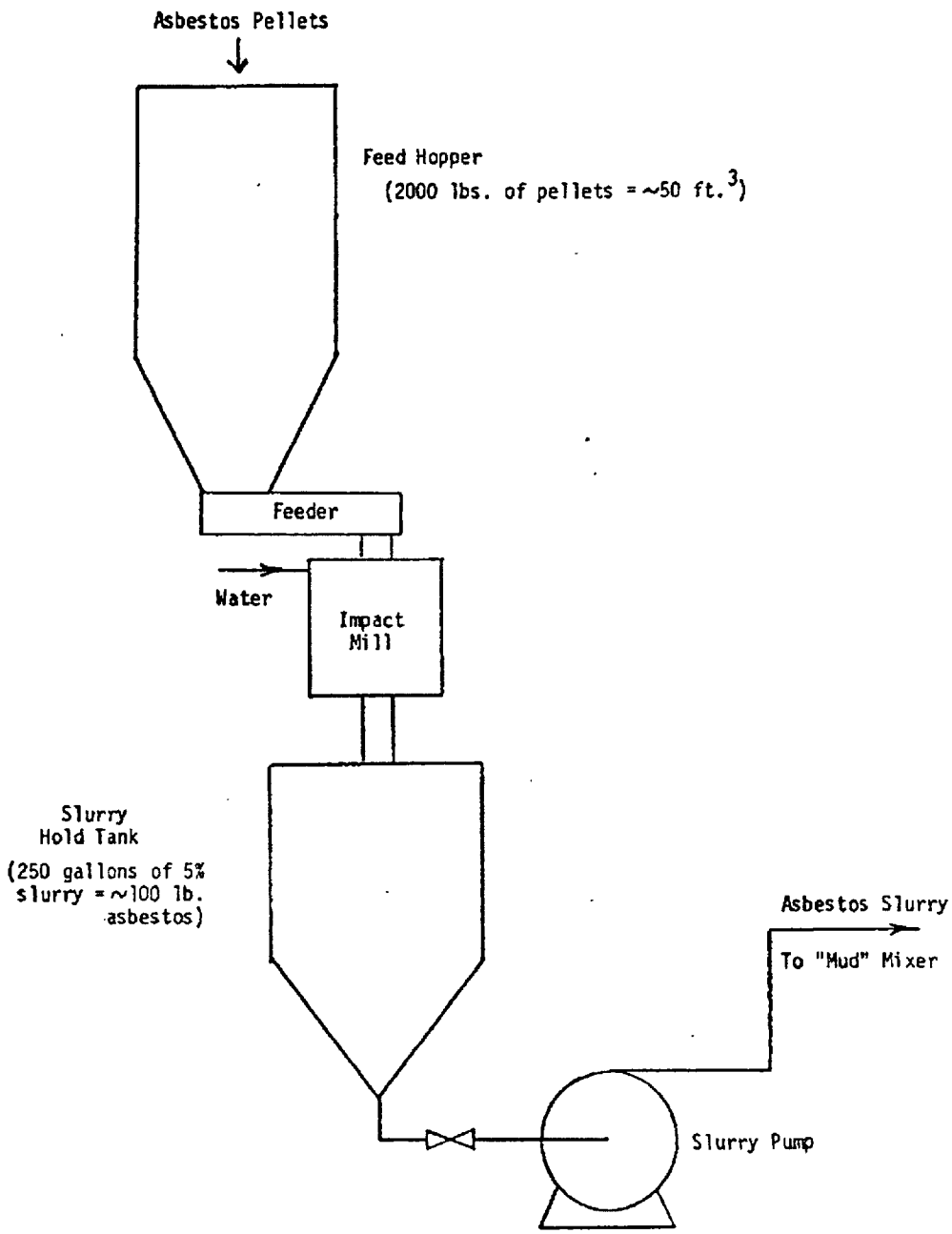
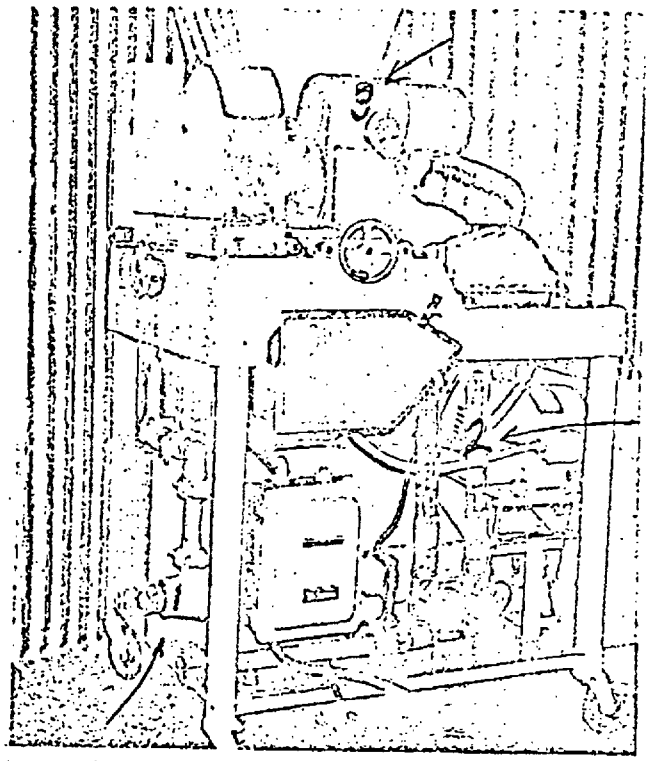


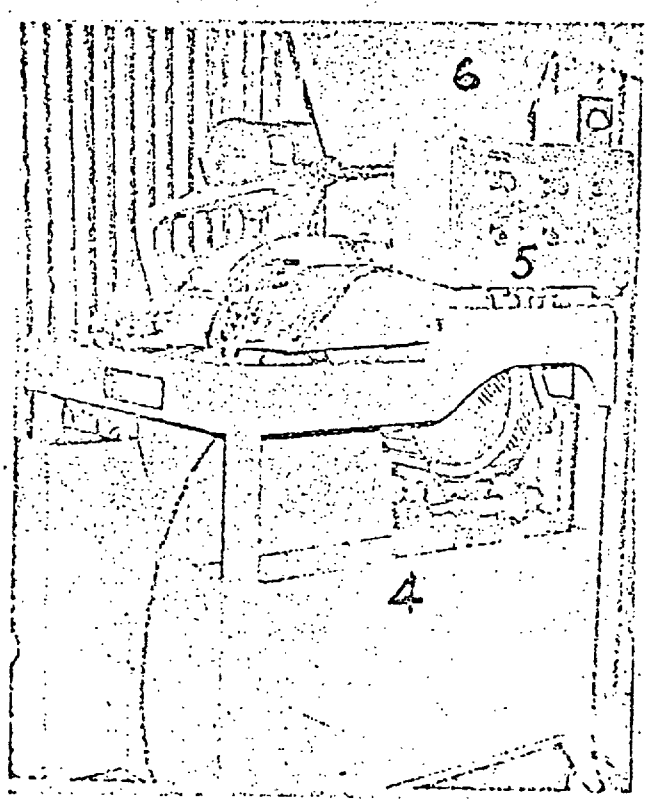
Figure 1

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PHOTOGRAPHS
PORTABLE REPULPER

View showing Slurry Discharge (1)
Rotameters (2) and
Screw Feed Speed Adjustments (3)





View showing Sump (4)
Control Panel (5) and
Feed Hopper (6)

Figure 2

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TABLE I

DELIVERED COST COMPARISON

OPEN FIBER VS. PELLETIZED ASBESTOS

Product	Carload Weight (lbs.)	Price[1] (¢/lb.)	Approximate Freight[2] (¢/lb.)		Approximate Delivered Cost ¢/lb.	Saving Via Pellets (¢/lb.)
SG-210 (Open Fiber)	54,600	5.0	Northeast	3.26[3]	8.26	----
			Texas	2.25[3]	7.25	----
			Georgia	2.80[3]	7.80	----
			Florida	3.33[3]	8.33	----
"Pelletized SG-210"	120,000	5.0	Northeast	2.13	7.13	1.13
in bags			Texas	1.60	6.60	0.65
			Georgia	2.17	7.17	0.63
			Florida	2.35	7.35	0.98
"Pelletized SG-210"	180,000	4.5	Northeast	2.01	6.51	1.75
in bulk			Texas	1.43	5.93	1.32
			Georgia	(1.99)[4]	6.49	1.31
			Florida	(2.17)[4]	6.67	1.66

(1) F.O.B. Welby, California 1/1/74.

(2) As of 2/22/74.

(3) Based on 60,000-pound minimum load.

(4) Bulk rates have not been set for these areas. Rates have been estimated at the same 0.18¢/lb. differential from the 120,000 lb. rate that applies to the Northeast.

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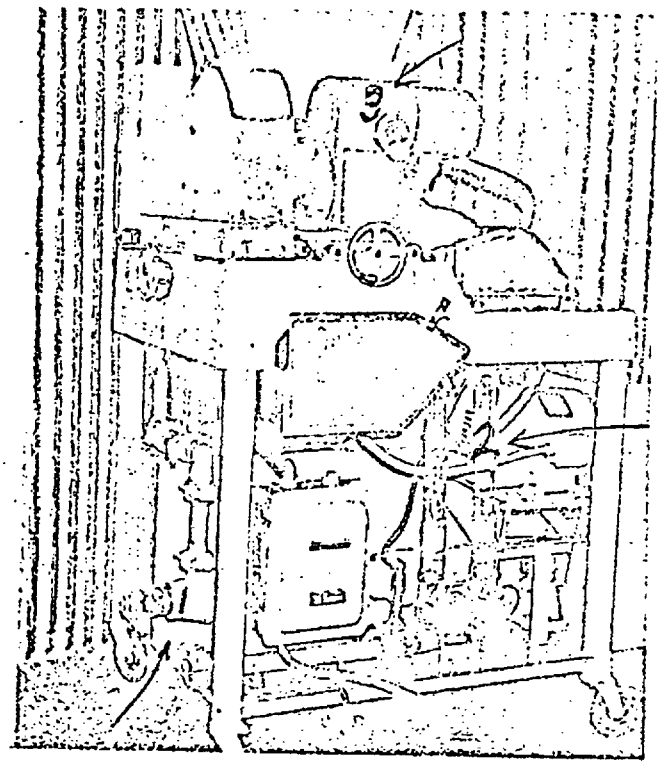
APPENDIX I

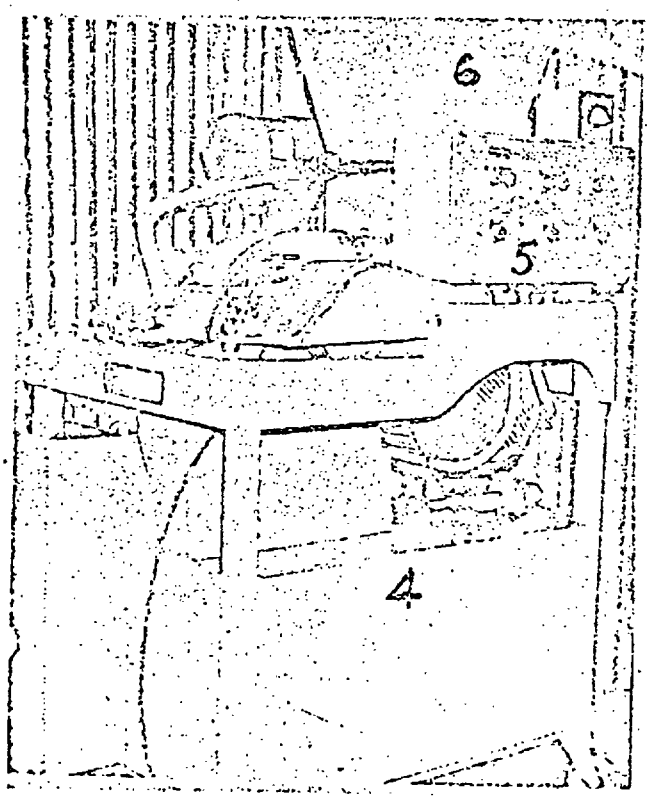
PELLET REPULPING EQUIPMENT

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PHOTOGRAPHS
PORTABLE REPULPER

View showing Slurry Discharge (1)
Rotameters (2) and
Screw Feed Speed Adjustments (3)





View showing Sump (4)
Control Panel (5) and
Feed Hopper (6)

Figure 2

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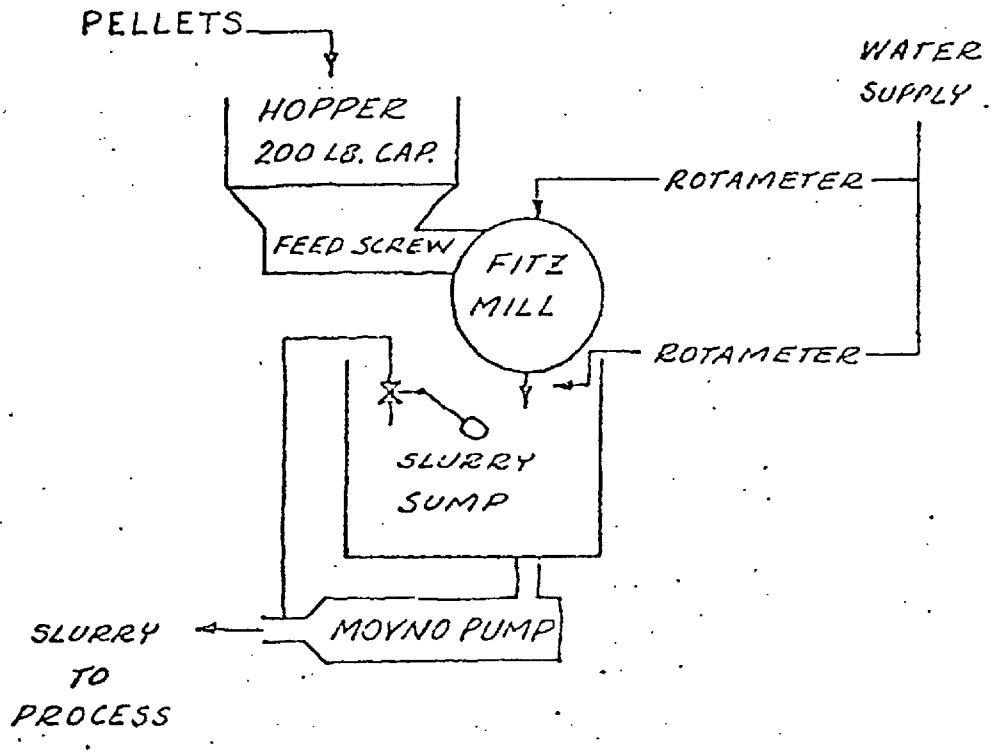


FIG. 1
SCHEMATIC
FLOWSHEET
FITZMILL REPULPER

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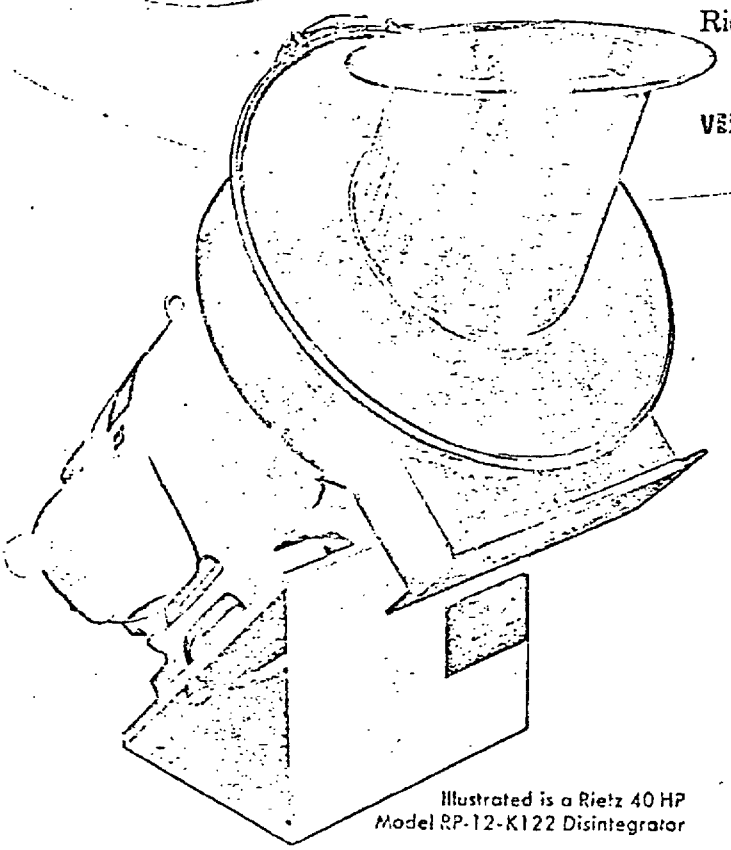
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RP Model Disintegrators

are designed for specific adaptation to size reduction requirements in the Food Process Industries.

Rietz RP Distintegrators offer

VERY LOW INITIAL COST
VERY LOW OPERATING COST
VERY HIGH EFFICIENCY



Illustrated is a Rietz 40 HP Model RP-12-K122 Disintegrator

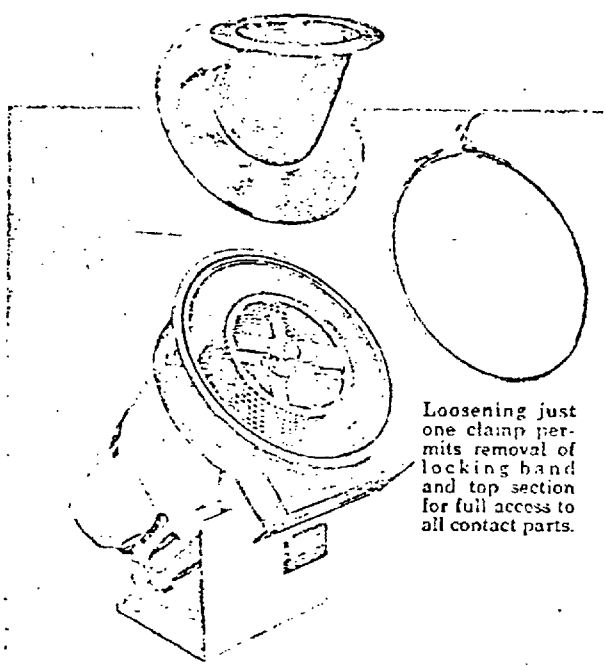
RUGGED SIMPLE DESIGN / Rietz RP design has reduced the complex operations of feeding, grinding and discharging to the ultimate in efficient simplicity. Fixed speed* direct-connected drive eliminates belts, gears and accompanying maintenance problems. 45° feed and discharge chutes speed product handling and shorten distance between inlet and outlet to reduce over-all vertical space requirements. Complete self-contained unit reduces weight and requires less floor space.

All of these features combine to make Rietz RP Disintegrators uniquely efficient machines measured either by

capacity per dollar of cost
or by
operating cost per output unit.

**All models of RP's are also available with direct-connected variable speed motors.*

see other side for information on
PRODUCT APPLICATION SIZE AND MODEL SPECIFICATIONS
VARIOUS STANDARD FEED AND DISCHARGE DESIGNS



Loosening just one clamp permits removal of locking band and top section for full access to all contact parts.

FAST EASY CLEANING / Rietz RP Disintegrators are unmatched in ease and speed of cleaning. As illustrated, releasing one clamp exposes all contact parts* for quick, thorough cleaning. Stainless bowl and top are free of joints, cracks and crevices.

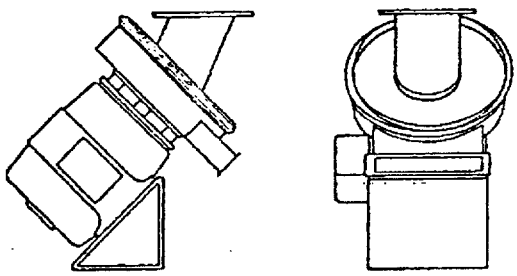
Illustration also shows RP operating principle. Rigid hammers disintegrate product on high speed impact. Combined centrifugal force and positive hammer action force product through 360° stainless steel screen. Screens are available in many mesh sizes, are quickly removable and replaceable for cleaning or interchange.

**All contact parts are of stainless steel for complete sanitation.*

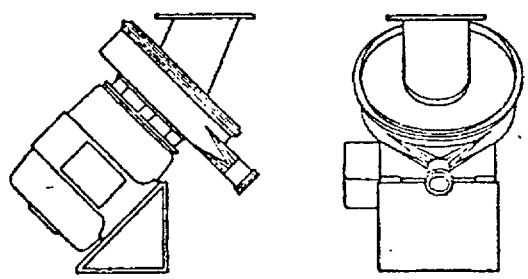
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Rietz RP's offer built-in adaptability

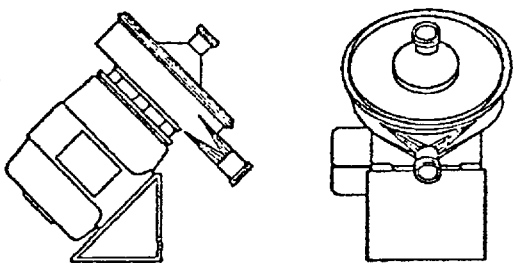
Three standard feed and discharge combinations are available to meet the process requirements of your particular products. The top and bowl sections illustrated below may also be ordered in any set of combinations for special situations.



Round Chute Inlet and Rectangular Outlet for Solids



Round Chute Inlet and Sanitary Thread Outlet for Purees



Sanitary Thread Inlet and Outlet for Liquids

SOME PROVEN APPLICATIONS FOR

RP DISINTEGRATORS

GRINDING — PULPING — CRUSHING
Fruits / Fats / Food Wastes / Horse-radish / Cheese
PUREEING
Vegetables / Fruits / Cooked Meats
SIFTING — CRUMBLING
Breads and Crackers / Flour
BLENDING — MIXING
Pastes / Cake and Pie Mix

SPECIFICATIONS
RIETZ RP SERIES DISINTEGRATORS

MODEL NO.	HP RANGE	RPM RANGE	ROTOR DIA.	SCREEN HEIGHT	CAPACITY EXAMPLES T/HR. THRU ¾" SCREEN	
					TOMATOES	APPLES
RP-8-K115	5 to 10	1800 3600	8"	2⅜"	7.5	5
RP-8-K126	10 to 20	1800 3600	8"	6¼"	15	10
RP-12-K122	20 to 40	1800 3600	12"	6¼"	30	20
,8-K133	40 to 75	1800 3600	18"	9⅜"	60	40

MANUFACTURING COMPANY

UCC 008575