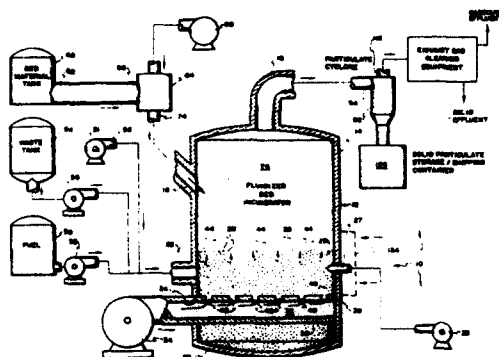


Apparatus for reducing finely divided iron oxide material, comprising a reactor containing a vertical upper reaction chamber connected downwardly to a narrower, vertical reaction chamber. A cyclone separator is connected to the upper reaction chamber for separating solid material and recycling it to the reactor so that a circulating fluidized bed can be maintained in the apparatus. In accordance with the invention, a recycling conduit is connected to the bottom of the lower reaction chamber. A tapping-off shaft for reduced material is also connected to the bottom of the lower reaction chamber. A reducing agent is supplied to the upper reaction chamber, and combustion air is supplied to the bottom of the upper reaction chamber. The apparatus also comprises means for preheating the iron oxide material with the exhaust gas from the reactor and for passing said preheated iron oxide into the lower reaction chamber. The apparatus also comprises means for stripping the exhaust gas from CO<sub>2</sub> and H<sub>2</sub>O and recycling it to the reactor to be used as fluidizing gas.

4359005

### FLUIDIZED BED INCINERATION OF WASTE

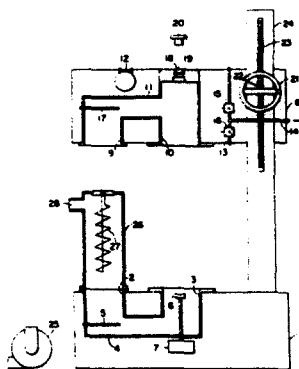
Virgil F Baston assigned to Energy Incorporated



Apparatus and methods for fluidized bed incineration of waste containing phosphorus wherein the bed comprises lime or limestone which negates heretofore existing problems incident to the presence of phosphorus.

4358901

### MULTIPURPOSE BASIC APPARATUS FOR TREATING POWDERS



Hikar Takabatake; Yoshiro Shudo  
assigned to Yamato Kagaku Kabushiki  
Kaisha

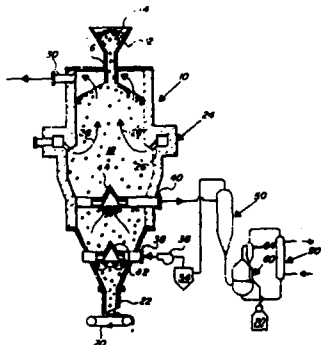
A multipurpose basic apparatus for treating powders which is applicable to various powder treatments including spray drying, fluidized bed drying and granulation and fluidized bed continuous drying, which apparatus comprises a lower frame provided with a piping having two openings facing upward, an upper frame provided with two openings facing downward which are respectively positioned in coaxially aligned relation to the above men-

tioned two openings of the lower piping, a feed pump for a sample and a feed pipe for pressurized air, and a lift for moving the upper frame up and down, the apparatus being designed in such a manner that either one or two of a fluidizing chamber, a filter chamber, and a spray drying chamber can be connected between one opening of the lower piping and the corresponding opening of the upper piping, and the other openings of the upper and lower pipings can be provided with one or more of a heater, an aspirator, and a cyclone.

4358310

### DRY COLLECTION OF METALLIZED FINES

Charles W Sanzenbacher; David C Meissner assigned to Midrex Corporation

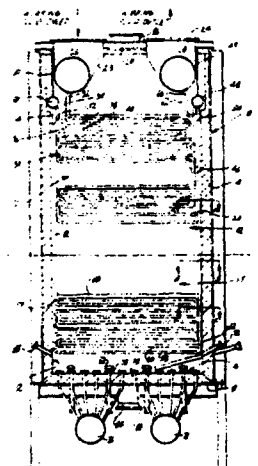


A method and apparatus for the dry collection of metallized fines from a direct reduction furnace cooling zone in which cooling gas removed from the cooling zone passes through a dust collector and the removed dust is cooled in a fluidized bed, the fluidizing gas being recirculated through an indirect cooler. The process is continuous and the fines are collected at a sufficiently low temperature for easy handling. The apparatus includes a hot gas cyclone in the cooling gas withdrawal line connected to a fluidized bed cooler, a conduit for withdrawing fluidizing gas from the fluidized bed cooler passes through a second cyclone dust collector then through an indirect cooler and returns to the fluidized bed cooler. Cool fines are withdrawn from the fluidized bed cooler into a collector.

4357907

### FLUIDIZED BED COMBUSTOR WITH IMPROVED INDIRECT HEAT EXCHANGER UNITS

John Campbell; Larry H Russell; Philip I Robinson assigned to Rockwell International Corporation



There is provided a fluidized bed combustor comprising an economizer contained in an upper interior portion and indirect heat exchange conduits suspended in the lower interior portion of the fluidized bed combustor in spaced relation to the interior surfaces of the fluidized bed combustor.

4357883

### BED DRAIN COVER ASSEMBLY FOR A FLUIDIZED BED

Joseph R Comparate; Martin Jacobs assigned to Combustion Engineering Inc

