

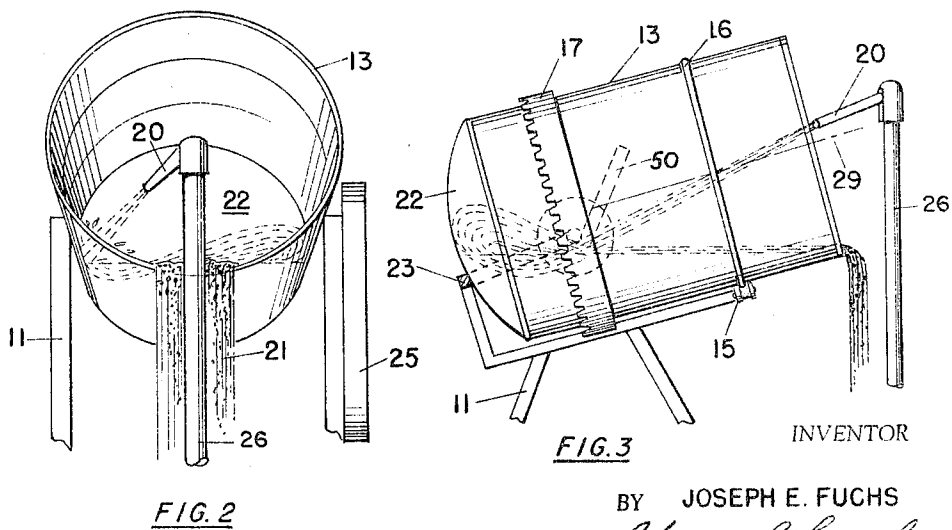
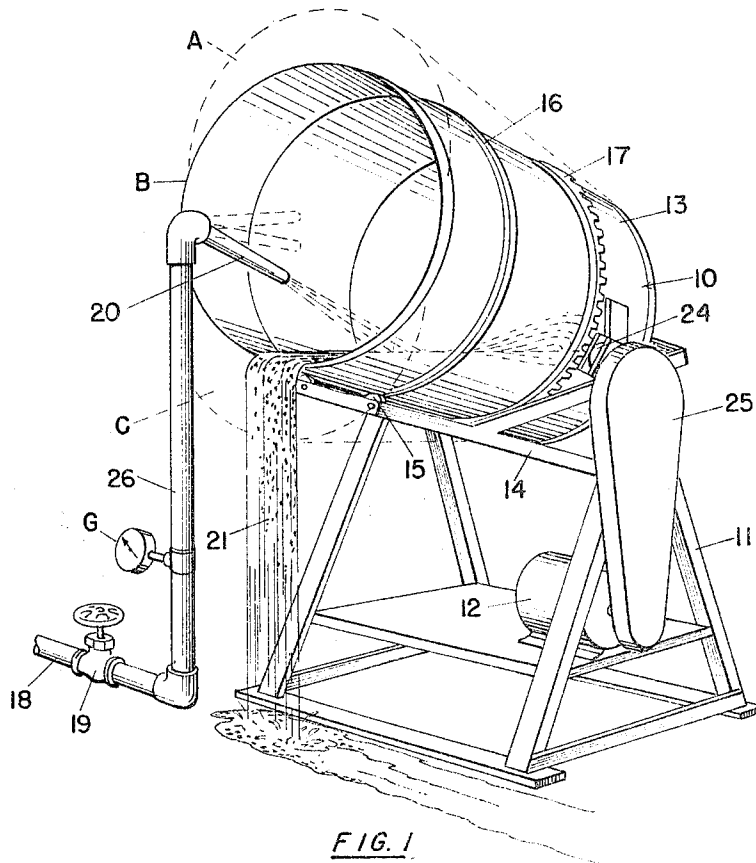
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PROCESS OF RECLAIMING METALLIC PARTICLES FROM FOUNDRY SAND

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PROCESS OF RECLAIMING METALLIC
PARTICLES FROM FOUNDRY SAND
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1 Claim. (Cl. 209—155)

This invention relates to processes for separating solids and, more particularly, to a process for separating metallic materials from non-metallic materials as in separating brass particles from foundry sand and the like.

In the invention disclosed, an apparatus such as an ordinary concrete mixer is used; however, a cylindrical drum having straight sides and a rounded bottom is provided instead of the usual frusto-conical shaped drum. The drum is rotated with its central axis at an angle of approximately thirty degrees to the horizontal. The drum is tilted forward progressively so that the angle is decreased to approximately fifteen degrees to the horizontal. Water flows into the drum at a volume that is equivalent to the output of a two inch pipe having a one and one-half inch nozzle dispensing water at approximately fifteen pounds per square inch. The drum should be rotated at approximately 16 r.p.m. for best results.

During this operation, the lighter materials are caused to flow out of the drum and the heavier or metallic materials remain in the drum. The mixer is rotated at a lower speed than is conventional in mixing concretes so that the material does not tumble inside the drum but rolls back on itself, thereby agitating the material and separating it so that the dirt and lighter materials flow out progressively and the heavier materials are kept in the drum.

It is accordingly an object of the present invention to provide an improved process for separating solids.

Another object of the invention is to provide an improved process for separating metallic from non-metallic materials.

Yet another object of the invention is to provide a simple apparatus for separating materials.

With the above and other objects in view, the invention comprises the processes set forth in the specification, drawing and recited in the appended claim, the invention will be better understood from a reference to the drawing and detailed specification wherein:

FIG. 1 is an isometric view of the apparatus according to the invention;

FIG. 2 is a front view of the apparatus shown in FIG. 1; and

FIG. 3 is a side view of the apparatus shown in FIG. 1.

Now with more particular reference to the drawing, the apparatus shown in FIGS. 1, 2, and 3 is very similar to the conventional type of concrete mixer; however, instead of having a frusto-conical shaped container or drum, a cylindrical container is used. The mixer is indicated generally at 10 having a frame 11 and motor 12 with a drum 13. The drum 13 is supported in a drum support or cradle 14 which has rollers 15 which engage the drum at the ring 16 which extends around the periphery of the drum. The lower end of the drum rests against the vertically extending frame member 23.

A ring gear 17 is fixed to the outer periphery of the drum in a conventional manner and this ring gear 17 is engaged by a suitable pinion indicated at 24 which is driven by a suitable belt or chain arrangement inside the guard 25 in a conventional manner.

Water is supplied through a water pipe 18 which may be two inches in diameter and a throttling valve 19 connects the pipe 18 to a pipe 26 which may be also two inches in diameter, for example, and this is connected to a smaller size nozzle 20 which may be one and one-half inches in diameter.

The nozzle 20 is disposed at a horizontal angle of approximately thirty degrees to the central axis 29 of the drum and approximately thirty degrees to the vertical axis of the pipe. The nozzle may be adjusted so that the water strikes the side of the drum just above the bottom and swirls over the bottom and back toward the open top. The drum will be tilted progressively by movement of handle 50 through a plurality of angles indicated in dotted lines in FIG. 1 at A, B, and C. As it is rotated, the waste material indicated at 21 will flow out of the drum while the other material will collect on the dome shaped bottom 22.

An example of the time increments and the angles through which the central axis of the drum is moved is indicated as:

Time (Minutes)	Central Axis of Drum to Horizontal (Degrees)	Pressure (Pounds per Square Inch)
5	30	10
8	25	10
8	20	8
10	18	8
10	16	8
15	14	7
20	12	6

The pressure indicated is measured by a gauge, for example, at G.

The water pressure and angles at which the water is inserted in the container can be refined and varied to suit the individual applications by observing the amount of dirt that is flowing out of the top of the drum and inspecting the effluent for metallic particles to make sure that no metallic particles are being lost.

When the process has been carried out as above and the water discharging from the container becomes relatively clean, the remaining particles in the drum will be rich in metal or in particles containing relatively high specific gravity materials and this material can be salvaged.

The foregoing specification sets forth the invention in its preferred practical forms but the process disclosed is capable of modification within a range of equivalents without departing from the invention which is to be understood is broadly novel as is commensurate with the appended claim.

The embodiments of the invention in which an exclusive property or privilege is claimed are defined as follows:

A process for separating a material containing foundry sand and metallic particles comprising

placing said material in a cylindrical open topped and rounded bottom container having its central axis inclined at approximately thirty degrees to the horizontal,

rotating said container at approximately 16 r.p.m. around its central axis,

projecting a stream of water into said container laterally at an angle of approximately thirty degrees to the central axis of said container and downwardly at an angle of approximately thirty degrees to the vertical

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to strike the side of the drum just above the bottom
and swirl the water over the bottom and back toward
the open top of said drum,
and progressively and intermittently decreasing the angle
of inclination of said central axis of said container 5
to approximately twelve degrees while rotating it,
thereby separating said metallic particles from said
foundry sand.

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