Feb. 13, 1962 F. LEADER 3,021,081

FLUX GRINDING APPARATUS

Filed April 18, 1960 4 Sheets-Sheet 1

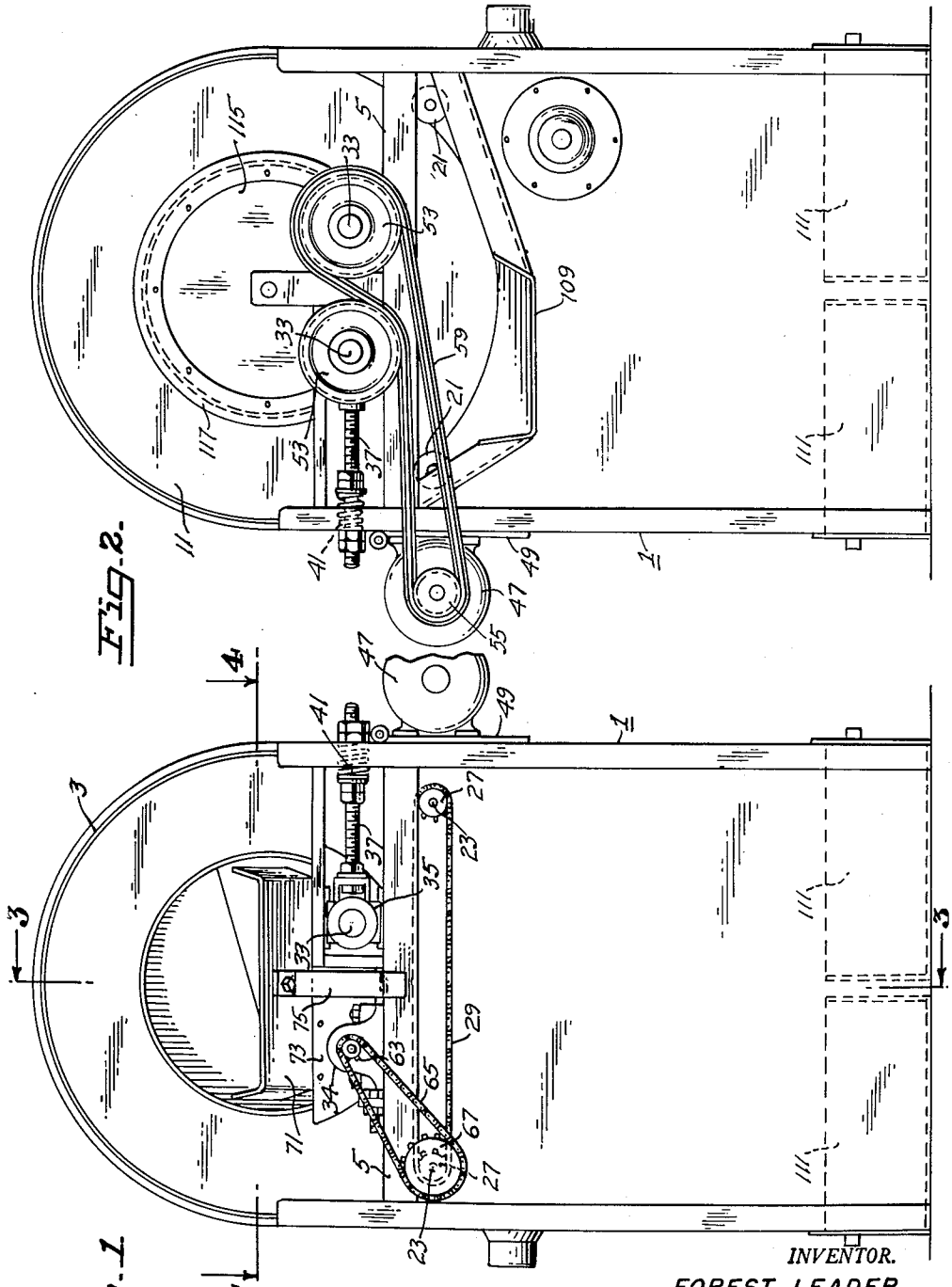


Fig. 2.

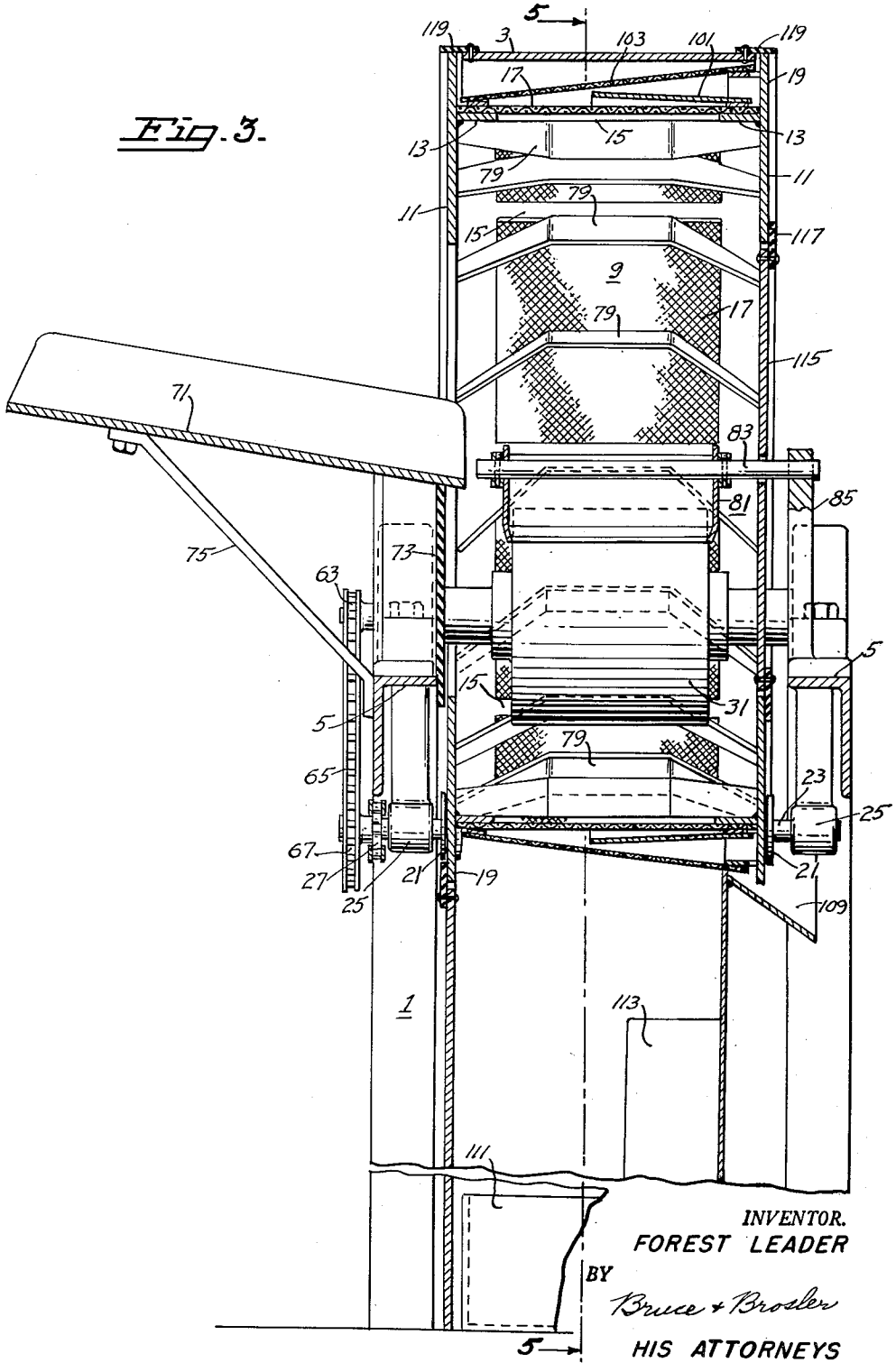
Fig. 1

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FLUX GRINDING APPARATUS

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Fig. 3.



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FLUX GRINDING APPARATUS

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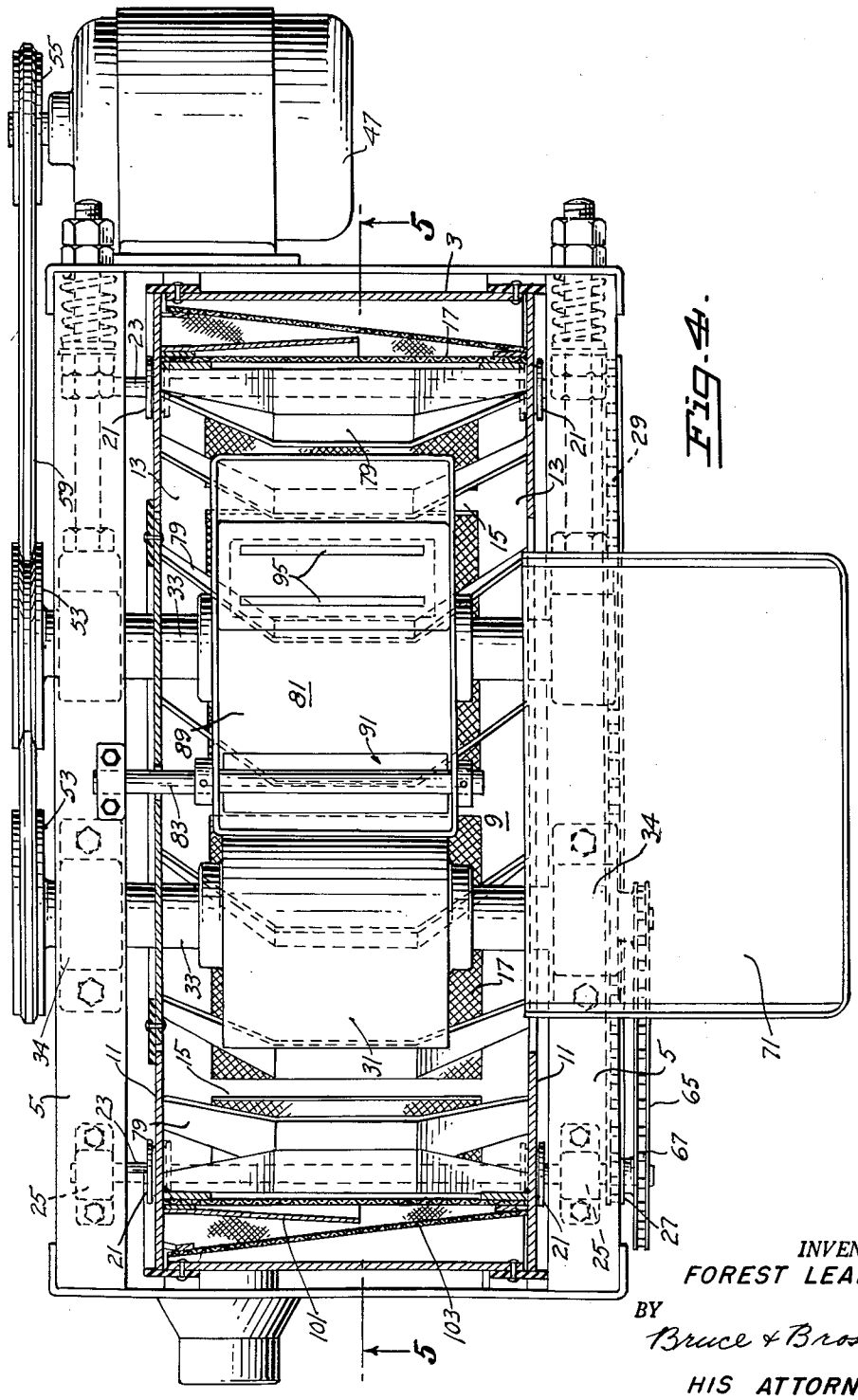


Fig. 4.

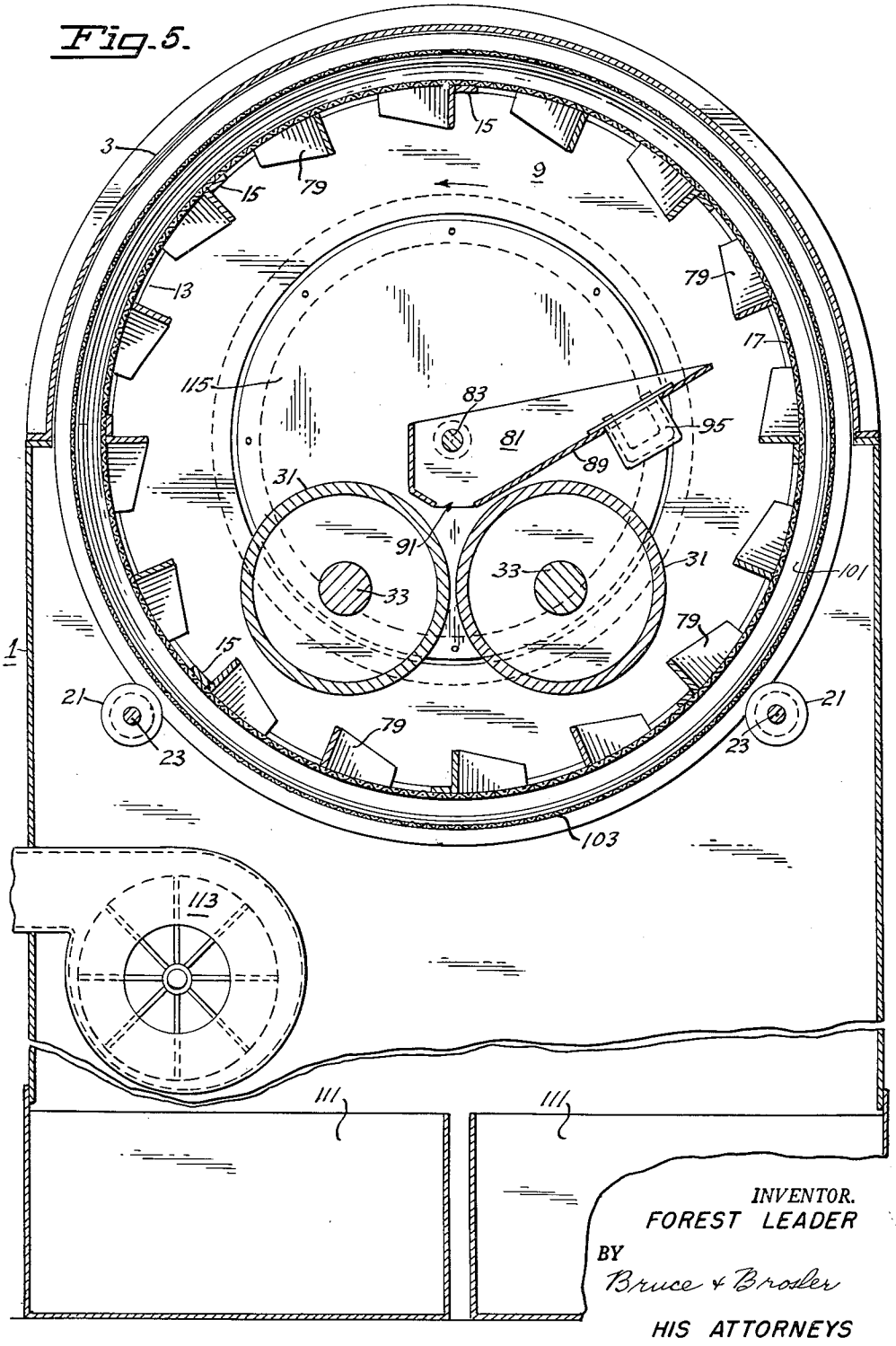
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Fig. 5.



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3,021,081

FLUX GRINDING APPARATUS

Forest Leader, Oakland, Calif., assignor to L & B Welding Equipment, Inc., a corporation of California

Filed Apr. 18, 1960, Ser. No. 22,797
3 Claims. (Cl. 241—91)

My invention relates to grinding apparatus and more particularly to grinding apparatus adapted for the recovery of welding flux.

Among the objects of my invention are:

(1) To provide novel and improved grinding apparatus;

(2) To provide novel and improved grinding apparatus adapted for the recovery of welding flux;

(3) To provide novel and improved flux grinding apparatus which produces a product of substantially uniform size and substantially free of weld metal and dust.

Additional objects of my invention will be brought out in the following description of a preferred embodiment of the same, taken in conjunction with the accompanying drawings wherein:

FIG. 1 is a front view in elevation of the flux grinding apparatus of the present invention;

FIG. 2 is a rear view in elevation of the apparatus of FIG. 1;

FIG. 3 is a view in section taken in the plane 3—3 of FIG. 1;

FIG. 4 is a view in section taken in the plane 4—4 of FIG. 1;

FIG. 5 is a view in section taken in the plane 5—5 of FIG. 3 and FIG. 4.

Referring to the drawings for details of my invention in its preferred form, the same comprises a housing **1** formed with an arcuate roof **3**, and included in the framework of such housing, in each side thereof, is a horizontal structural member or beam **5** located at a substantial elevation above the floor of the housing. These beams constitute the main support for the operating mechanism of the apparatus, included in which is a cylindrical screen assembly **9**.

This screen assembly comprises a pair of aligned annular side plates **11** disposed in parallel planes, each provided with a concentric inwardly directed circular flange **13** connected in spaced opposing relationship to each other by uniformly spaced connecting strips **15** to form a cylindrical frame about which to wrap and support a cylindrical screen **17**. The concentric flanges **13** are located on a radius substantially less than the outermost radius of the side plates **11** to leave an overhanging rim **19** for each side plate.

The cylindrical screen assembly **9** is rotatably supported concentrically with and close to the roof **3** of the housing, on two pairs of driven rollers **21**, the peripheries of which are grooves to receive the outermost edges of the rims **19** of the plates, which function as tracks for this purpose. Each pair of rollers is fixed to a roller shaft **23** supported in bearings **25** suspended from the horizontal beams **5**, the roller shafts, each at one end, extending beyond its supporting bearing sufficiently to mount a sprocket **27**, the two sprockets being then coupled by a drive chain **29**.

Disposed transversely of the cylindrical screen assembly somewhat below the center axis thereof, is a pair of closely positioned grinding rolls **31** each fixed on a shaft **33**, one shaft being supported in fixed bearings **34** mounted on the horizontal beams **5**, while the other shaft is carried in slidable bearings **35**, each of which is adjustably positioned on one of the beams **5**, by an adjusting screw **37**, acted on by a compression spring **41**, the spring also serving to give, in the interest of safety, should a

piece of metal or noncrushable material gain access between the grinding rolls.

The cylindrical screen assembly **9** and the grinding rolls **31** are driven from a common motor **47** mounted on a bracket **49** affixed to an end wall of the housing **1**. To effect such drive, each of the grinding roll shafts **33** carries a pulley **53** in the plane of a drive pulley **55** mounted on the shaft of the drive motor **47**, and a drive belt **59** passing under the pulley of one roll shaft and encircling the pulley of the remaining roll shaft, will cause both grinding rolls to rotate in opposite directions, the direction of the drive motor being such as to cause the grinding rolls to rotate with their opposing surfaces moving downwardly.

The drive to the sprockets **27** of the cylindrical screen supporting rollers **21** is taken off from one of the grinding roll shafts, and this is accomplished by mounting a sprocket **63** on the end of one of said shafts and coupling the same by a drive chain **65** to a second sprocket **67** mounted on the end of one of the roller shafts **23**. Thus the cylindrical screen assembly and the grinding rolls will function in unison and in properly timed relationship.

Welding flux to be ground and recovered is fed to the cylindrical screen **17** from an external inclined chute **71** supported at its discharge end on a plate **73** spanning the lower portion of the central opening in the proximate annular side plate **11**, and mounted on the proximate beam **5**, while at its other or elevated end, the chute is supported by a brace **75**. Material sliding down the chute will drop to the lower portion of the cylindrical screen **17**.

To bring this material from the screen to the grinding rolls, the screen assembly **9** is provided with a plurality of pockets about the internal periphery thereof which may be formed by a plurality of equally spaced essentially arcuate or angularly formed walls or fences **79** disposed transversely of the screen and anchored at each end to the screen supporting flanges **13**. These strips will pick up material in the lower portion of the screen assembly and carry it up with rotation thereof, and when each reaches a position approaching the peak of its travel, the contents of a pocket will be discharged therefrom.

In the path of such discharge is a hopper **81**, which is fixed to and supported on a cross shaft **83** anchored at one end to an upright **85** mounted on one of the cross beams **5**. This hopper includes a long descending floor **89** terminating adjacent its lower end in a discharge opening **91** immediately above the entrance between the grinding rolls **31**. Inasmuch as only material capable of passing through the cylindrical screen will sift through, any articles of a size too large to sift through the screen, will be carried up in the various pockets provided by the cross strips **79** and discharge into the hopper **81** for grinding to a smaller size.

To effectively remove any metallic particles such as weld metal which may inevitably become mixed in with the flux to be recovered, a relatively strong magnet **95** is mounted in the sloping floor of the hopper in the path of material discharging from the various pockets of the cylindrical screen, and any metallic particles thus trapped, may be removed periodically.

The material thus sifted through the cylindrical screen will comprise a mixture of the desired flux particles and undesired dust, and means is provided for separating these two components so that the recovered flux will be substantially free of dust.

Toward this end, a frusto-conical baffle **101** of sheet metal or the like is disposed about the cylindrical screen **17**, with its smaller end anchored to side plate **11** or proximate point of the screen assembly, such baffle terminating approximately half way across the screen assembly.

Encircling the baffle **101** is a frusto-conical screen **103**

of a mesh which will sift dust particles but not flux particles of desired size. This screen is of a width to span the cylindrical screen and is affixed to the screen assembly with its smaller end adjacent that side plate **11** opposite the side plate to which the baffle **101** is anchored, while the larger end of this screen is supported on spaced brackets extending inwardly from the proximate side plate.

In operation, the siftings from approximately one half of the cylindrical screen **17** will fall directly upon the smaller end of the dust screen **103** while approximately the remaining half of the siftings from the cylindrical screeen will drop upon the baffle **101**, which in turn will discharge such siftings upon the same or smaller end of the dust screen **103**. In this manner, all of the siftings will land upon the smaller end of the dust screen, and due to its frusto-conical form, such material will then tend to drift, during rotation of the cylindrical screen assembly, toward the larger end of the dust screen, thereby affording the dust components maximum opportunity to sift through the dust screen by the time the larger particles reach the larger end of the dust screen from which they are discharged between the many supporting brackets.

The desired particles thus separated from the dust and discharged from the edge of the dust screen, may be caused to drop into a delivery chute **109** supported just below the discharge edge of the dust screen and extending outwardly of the housing for collecting and guiding such particles into a receptacle such as a barrel or the like positioned at the discharge end of such chute. The heavier of the dust particles may be caused to drop into one or more drawers **111** built into the housing at the floor level, or such particles may be permitted to pile up on the housing floor to be shoveled out at a later time.

The lighter dust filtering through the dust screen may be withdrawn by means of suitable blower **113** built into the housing for this purpose.

Escape of material or dust through the central opening of the side plate **11** opposite the feed side of the cylindrical screen assembly, may be blocked by provision of a circular plate **115** fitting such opening and having affixed thereto about its rim, a circular flange **117** of flexible material extending across the resulting circular slit, to block escape of dust or particles therethrough, while still permitting rotational movement of the proximate side plate with respect thereto.

Further to preclude escape of dust or particles through the narrow slit formed between the outer rims **19** of the side plates **11** and the arcuate roof **3** of the housing, while still permitting of the rotational movement of the screen assembly, a sealing flange **119** is applied along each edge of the arcuate roof in overlapping engagement with the edges of the proximate side plates.

From the foregoing description of my invention in its preferred form, it will be apparent that the same fulfills all the objects of my invention, and while I have illustrated and described the same in great detail, I do not wish to be limited in my protection to such details as I have illustrated and described except as may be necessitated by the appended claims.

I claim:

1. Welding flux grinding apparatus comprising a cylindrical screen, means rotatably supporting said screen with its longitudinal axis horizontal, means for rotating said cylindrical screen about its axis, means for grinding flux and dropping same onto said screen for passing flux particles up to the size of said screen openings and retain particles of larger size, and means for lifting and feeding said larger size particles to said grinding means, said means including a guide to receive and direct such particles to said grinding means, and a magnet carried by said guide in the path of such particles to attract and hold magnetic material mixed in with such particles.

2. Welding flux grinding apparatus comprising a cylindrical screen, means rotatably supporting said screen with its longitudinal axis horizontal, means for rotating said cylindrical screen about its axis, means within said cylindrical screen for grinding flux and dropping the same onto said screen for passing flux particles up to the size of said screen openings and retain particles of larger size, and means for lifting and feeding said larger size particles to said grinding means, said means including a plurality of pockets disposed at spaced intervals about the inner surface of said screen, and a hopper supported in position to receive the particles discharged from said pockets and guide the same to said grinding means, and a magnet in the path of movement of such particles to attract and hold magnetic material mixed in with such particles.

3. Welding flux grinding apparatus comprising a cylindrical screen, means rotatably supporting said screen with its longitudinal axis horizontal, means for rotating said cylindrical screen about its axis, means within said cylindrical screen for grinding flux and dropping same onto said screen for passing flux particles up to the size of said screen openings and retain particles of larger size, and means for lifting and feeding said larger size particles to said grinding means, said means including a plurality of pockets disposed at spaced intervals about the inner surface of said screen, and a hopper supported in position to receive the particles discharged from said pockets and guide the same to said grinding means, and a magnet in the path of movement of such particles to attract and hold magnetic material mixed in with such particles, and means for removing dust particles from the siftings from said cylindrical screen, said means including a frusto-conical baffle encircling said cylindrical screen with its small end in proximity to one end of said cylindrical screen and its larger end in proximity to the transverse mid-plane of said cylindrical screen, and a frusto-conical screen encircling said frusto-conical baffle with its small end in proximity to the opposite end of said cylindrical screen and its large end terminating in a free edge, in proximity to the first end of said cylindrical screen, said frusto-conical screen being of smaller mesh than said cylindrical screen.

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