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of the main control system **48**. One of the operators removes the feed hopper **310** from the feed center **46**.

The feed center operator disconnects the vacuum line **318** from the cyclone collection pan **314**, and blows off what little powder remains in the pan **314**. Note that at all times the after-filter **304** system is operational so that any powder blown off the pan **314** is drawn up into the cyclone and exhausted to the after-filter **304**. When the pan **314** is open, any powder from the extraction duct **40** also passes straight into the cyclone exhaust to the after-filter **60**, because with the pan open the cyclones **42** are non-operational as separators.

With the vacuum pump **326** still on, the operator inserts one or more cleaning devices into the cyclone end of the vacuum line **318**. For example, a foam cylinder or other spongy or soft body may be used. The cleaning device is pulled through the vacuum line **318** by the vacuum suction and exits inside the vacuum receiver **320**. Several cleaning devices can be sent through the line **318** to assure thorough cleaning. Preferably the line **318** is a smooth walled seamless structure such as stainless steel or aluminum tubing.

Next the guns **20** and pumps **308** are purged. The control system **48** lowers the suction tube array **312** via the pump support frame **384** onto the purge manifold **396**, sends purge air pulses through the suction tubes **312**, the pumps **308**, the hoses **306** and the guns **20**. This powder from the purging is swept up into the extraction duct **40**. After purging the suction tubes **312** and pump support frame **384** are raised. The outsides of the suction tubes **312** are blown off and the booth operator blows off the door **150** seams from outside the booth **10**. The control system **48** is then instructed to stop the floor **16** rotation and raise the floor **16** to its sealed position against the bottom of the canopy **12**. The booth operator can enter the booth **10** and walk on the floor. Using a pressurized air wand, the operator blows what little powder is on the booth walls and ceiling down onto the floor **16**. The operator also blows powder off the extraction duct **40**. After complete blow-off, the operator exits the booth **10**, and the control system **48** is instructed to lower the floor **16** to its rotation position, and the blown-off powder is extracted to the cyclone system **42**. At this time the seal blow-off valve **80** is also activated to completely blow powder off the seal **104** and draw powder off the floor **16** portion that extends outside the perimeter of the canopy **12** walls. The booth is thus completely purged of powder.

The vacuum receiver **320** is designed so as to rotate about the axis VR whereby the top of the canister **322** is about shoulder height and facing the feed center operator. The vacuum pump line **327** is disconnected from the canister top **336**, as is the pulse air line from the positive pressure source **330**. In this position, the operator can easily rotate the receiver **320** so that the lid **336** is facing the operator (i.e. facing the front of the feed center **46**). The operator unlatches and removes the lid **336** and removes the color specific filter **324**. The cleaning sponges are also removed. The operator then blows off the canister **322** interior, the lid **336** and related parts.

The sieve **334** top section is removed and the color specific filter screen **335** is removed. If a similar shade (light to light or dark to dark) color will be next used, the sieve screen **335** is blown off. If a different shade will be used next, the screen is set aside for later cleaning. The sieve **334** is then cleaned and the proper screen **335** installed. Another color-specific filter **324** specific to the next color being sprayed is then mounted on the lid **336** and inserted into the canister **322**. The lid **336** is re-latched and the canister **322** swung back to its vertical position (as shown in FIG. 22).

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The vacuum lines **318** and **327** are then reconnected to the receiver **320** and the pulse air line is also reconnected. While the feed center sieve and vacuum receiver are being cleaned, the other operator has opened access doors in the cyclone lower cones **350a** and **350b** and blows off all interior surfaces of the cyclones and any powder remaining in the pan **314**.

Next the feed hose manifold **385** is removed and another manifold installed for the next color. The other ends of the new feed hoses are connected to the spray guns **20**.

Another feed hopper **310** that contains the next color powder coating to be sprayed is then installed into the feed center **46** and the suction tubes and pumps **308** lowered into operational position. Lastly, the cyclone doors are closed, the collection pan **314** closed and the vacuum line **318** reattached to the collection pan **314**. This completes the exemplary color change operation.

It will be readily appreciated that the color change procedure is greatly facilitated by the efficiency and thoroughness by which powder overspray is removed in a real-time manner from the booth **10** during a spraying operation due to the interaction between the rotating floor **16** and the overlaying extraction duct **40**. However, the vacuum conveyance feature of the present invention, which conveys powder from the cyclone system **42** to the feed center/application system, may be used with any powder extraction and spray booth arrangement, including a cartridge filter type collection system.

It is intended that invention not be limited to the particular embodiments and alternative embodiments disclosed as the best mode or preferred mode contemplated for carrying out the invention, but that the invention will include all embodiments falling within the scope of the appended claims.

Having thus described the invention, we claim:

1. Powder recovery apparatus for a powder coating spray system, comprising:

- a powder spray booth;
 - a cyclone having an inlet thereto that receives powder entrained in air from said spray booth wherein said cyclone operates to separate powder from the air; said cyclone having an outlet for recovering said separated powder and an exhaust for air;
 - a conduit with first and second ends that connect the cyclone outlet to a container; and
 - a negative pressure source coupled to said cyclone outlet by said conduit;
- said negative pressure source producing a negative pressure within said conduit from said first end thereof to said second end thereof with an induced air volume that causes a flow of powder from said cyclone outlet to said container to reduce powder lost through said cyclone exhaust.

2. The apparatus of claim 1 wherein said cyclone operates at a static pressure and said negative pressure source produces an induced air volume that is sufficient to draw powder from said cyclone outlet to optimize powder recovery.

3. The apparatus of claim 1 wherein said negative pressure source comprises a vacuum pump.

4. The apparatus of claim 3 wherein said vacuum pump is coupled to said container; said container being coupled to said cyclone outlet.

5. The apparatus of claim 4 wherein said container comprises a receiver having a filter that separates powder from said induced air flow.

6. The apparatus of claim 5 wherein said receiver is coupled to said cyclone outlet by a pipe.