Aug. 16, 1966 J. D. McCUNE 3,266,193

SAND SUPPLY CONTAINER

Filed June 11, 1964

Fig. 1

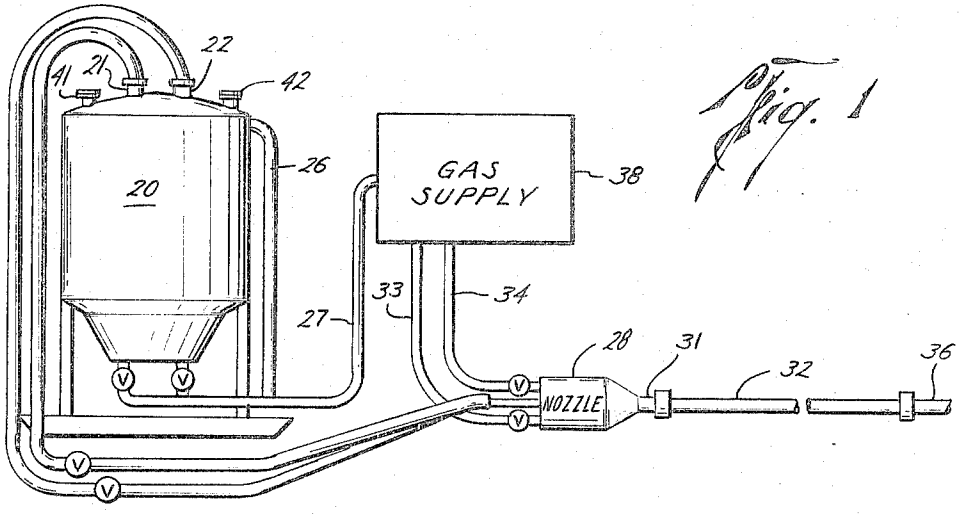


Fig. 2

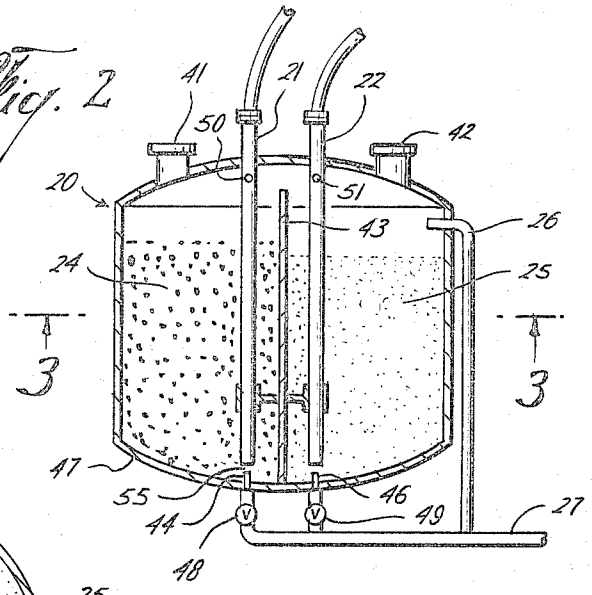
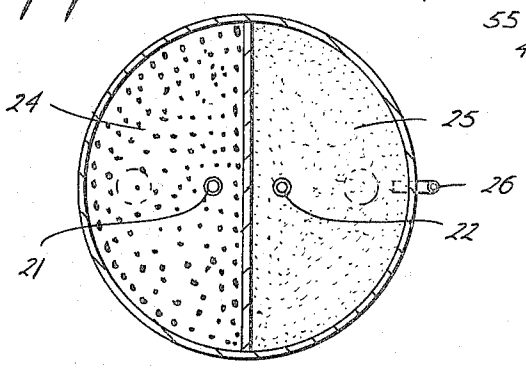


Fig. 3



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SAND SUPPLY CONTAINER

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This invention relates to a sand supply container and, more particularly, to a container having provision for more than one kind of abrasive material in a common pressure system.

A method has been developed for cleaning pipelines using an abrasive material or sand; the operation being applicable to large diameter long distance gas transmission lines as well as to process lines used in plants and refineries. Sand or other abrasive material which is stored in a container is forced under air or gas pressure into one end of a pipeline and propelled under pressure through the line and out an open end of the line. It is often desirable to use more than one grade or more than one type of abrasive during the cleaning operation, i.e. a larger or more coarse abrasive is used for initial cleaning operations and a finer grade is used to finish the cleaning or polish the interior of the line to smoothness. Heretofore, in order to use different grades of abrasive in the cleaning operation it has been necessary to use two or more sand supply containers for storing the different abrasive materials and supplying same to an injection head on the inlet end of the pipe to be cleaned. Additionally, when it is desired to change from one grade of sand or abrasive to another, it was necessary to remove connections to one supply container and to reconnect the piping to another supply container. In the event that the pipe being cleaned is of large diameter and long length, the sand supply containers are necessarily of a large size and often mounted on a trailer or other suitable vehicle. In the event that more than one grade of abrasive is used in a cleaning operation, it may also be necessary to provide a trailer or other vehicle for each supply container thereby further increasing the amount of equipment used in the process.

It is therefore an object of the present invention to provide a single container for supplying more than one grade of abrasive material.

It is a further object of the invention to provide a container for supplying more than one grade of abrasive material wherein the abrasives are separated in the container by a partial partition leaving the abrasive under the influence of a common pressure for entraining the abrasive into a stream of gas.

With these and other objects in view, the present invention contemplates an apparatus for supplying abrasive materials to the injector nozzle of a pipeline cleaning system. The container for storing the various abrasives is divided into sections by baffle plates, the plates extending to a point below the top of the container to provide an air space above the abrasive common to all the sections of the container. A pipe extends from a point near the bottom of each section of the container out through the top of the container. Another pipe extends into the bottom of each section of the container and is in alignment with the pipe extending out through the top of the container. Air under pressure is forced into the pipe at the bottom of the container which air passes out of the container through the pipe extending through the top. As the air passes between the two pipes abrasive is entrained in the airstream and carried through the upper pipe to the injection head of the celaning system. Air or gas under pressure is also supplied to the common air space at the top of the container to provide a pressure on top of the abrasive material in each of the sections.

A complete understanding of this invention may be had by reference to the following detailed description when read in conjunction with the accompanying drawings illustrating an embodiment thereof, wherein:

FIG. 1 is a schematic view of a system for cleaning pipelines with abrasive material;

FIG. 2 is a detailed vertical section of a sand supply container embodying the present invention; and

FIG. 3 is a section taken along line 3—3 of FIG. 2.

Referring first to FIG. 1, a sand blasting apparatus is shown for cleaning a pipeline. This apparatus includes a container 20 for sand, outlet pipes 21, 22 extending into the top of the container and downwardly therein, pipe means 26 for introducing air or gas under pressure into the container above the level of the sand and pipe means 27 for introducing air or gas under pressure into the lower end of the supply container to cause a flow of the abrasive and gas mixture into the pipeline through pipes 21 or 22. Pipes 21, 22 are connected to an injection nozzle 28 which is positioned at the upstream or inlet end 31 of the pipeline 32 to be cleaned. Additional air or gas is discharged into the injection nozzle through pipes 33, 34 to cause further mixing of gas and abrasive and to provide a means for propelling the abrasive mixture through the pipeline to scour the interior of the pipeline. After passing through the pipe, this mixture of gas and abrasive then emerges from the open end 36 of the pipeline into the atmosphere. Air or gas is supplied to the pipes 26, 27, 33 and 34 by an air compressor 38 or other gas supply as may be convenient.

FIG. 2 shows a detailed view of the sand supply vessel described above. A pair of openings 41 and 42 are provided on top of the vessel 20 for filling the vessel with abrasive materials 24 and 25. A partition or baffle 43 is positioned within the container and extends from one side wall of the container to the other across the diameter of the container and from the bottom of the container to a point near the top of the container but not connected to the top. The abrasive feed pipes 21 and 22 extend from a point near the bottom of the container below the level of sand in the container through the top of the container. Air or gas jets 44 and 46 extend through bottom 47 of the container at a point in alignment with the feed pipes 21 and 22. These jets in turn are connected through valves 48, 49 to the gas supply pipe 27 extending from the compressor 38 to the sand supply container 20. A pressurizing pipe 26 extends from the pipe 27 into the sand container 20 at a point near the top of the container, the space at this point being comomn to each section of the container divided by partition 43. Holes or apertures 50, 51 are provided in each of the abrasive feed pipes 21, 22 at a point near the top of the container above the abrasive level which point is in communication with air supplied through the pressurizing pipe 26.

In the operation of the apparatus described above, air or gas from the compressor or other supply 38 is provided through the gas supply pipe 27 to nozzle 44 or 46 at the bottom of the sand supply container 20 depending upon which one of the valves 48, 49 is open. Air flows through one of the nozzles into the abrasive feed pipe positioned above the nozzle and in alignment therewith. As the gas passes through a gap 55 between the nozzle and the feed pipe, abrasive is entrained into the stream of gas and forced upwardly through the feed pipe. The same air or gas pressure which is supplied to the jets at the bottom of the container is also supplied to the space above the abrasive materials 24 and 25 in the divided sections of the container to afford a presure on top of the material and assure movement of the sand into the air stream through the gap 55. This supply of air or gas which acts downwardly on the abrasive material is also in communication with the apertures 50, 51 in the feed pipe above the

abrasive level. This further introduction of gas under pressure into the feed pipe assists in moving the sand to the injection nozzle through the feed pipes.

When it is desired to use another size or texture of abrasive material the valve 48 or 49 which previously was opened is now closed and the other valve is opened. Without further disconnections and connections of pipe being necessary the other abrasive material is supplied to the injection head in the sand cleaning system.

It should be noted that rather than extending each of the abrasive feed pipes to the injection head, a single pipe or hose may be used and attached to the feed pipe which is being used at that time.

While particular embodiments of the present invention have been shown and described, it is apparent that changes and modifications may be made without departing from this invention in its broader aspects and, therefore, the aim in the appended claims is to cover all such changes and modifications as fall within the true spirit and scope of this invention.

What is claimed is:

1. An apparatus for supplying sand to a sand cleaning device comprising:

an enclosed vessel for receiving an abrasive material,

partition means dividing the vessel into sections, said partition means extending across the vessel from one side to the other and from the bottom of the vessel to a point near its top,

access means in said vessel for providing a separate access to each section,

valved nozzle means extending through the bottom of said vessel into each section,

pipe means extending through said vessel into each section to a point below the level of material in said vessel, said pipe means at said point being axially aligned with said valved nozzle means,

means for supplying a gas under pressure to said valved nozzle means, and

means for diverting gas from said supplying means to a place in said vessel above the level of material therein, which place is in communication with the space in said vessel above the top of said partition means common to each section of said vessel.

2. The apparatus set forth in claim 1 and further including openings in said pipe means at a point above the level of material in the vessel which point is in communication with the comomn space above the partition means.

References Cited by the Examiner

UNITED STATES PATENTS

2,553,625	5/1951	Andersen	51—12
3,139,704	7/1964	McCune	51—12 X

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