Sept. 2, 1958 G. F. ROONEY, JR 2,850,214

PNEUMATIC DRY POWDER OFFSET ELIMINATOR

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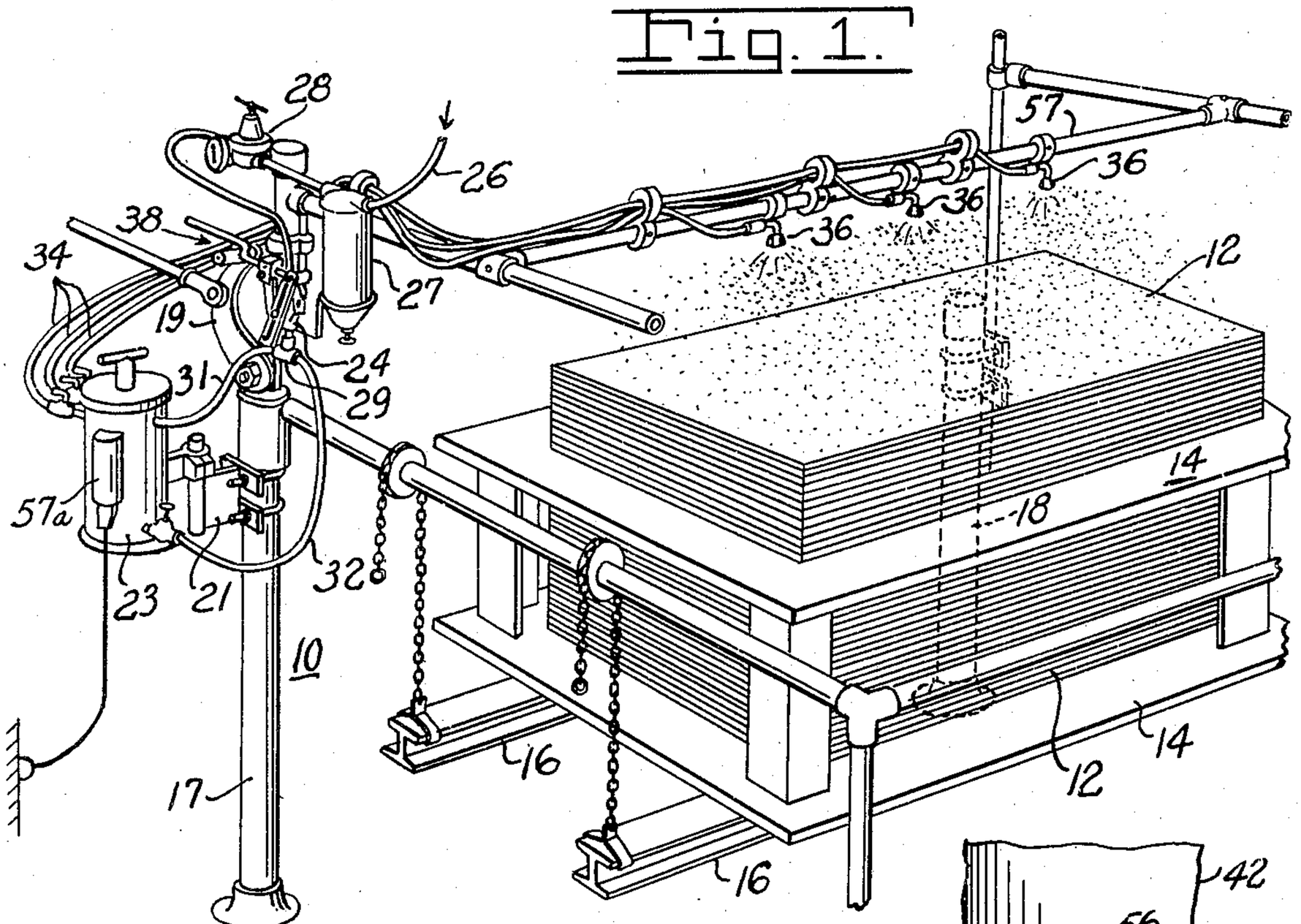
Fig. 1.



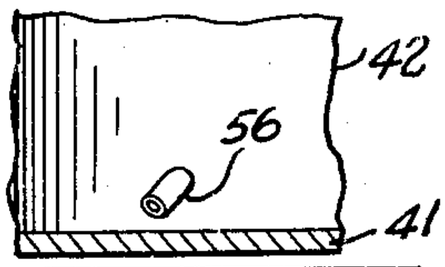


Fig. 4.

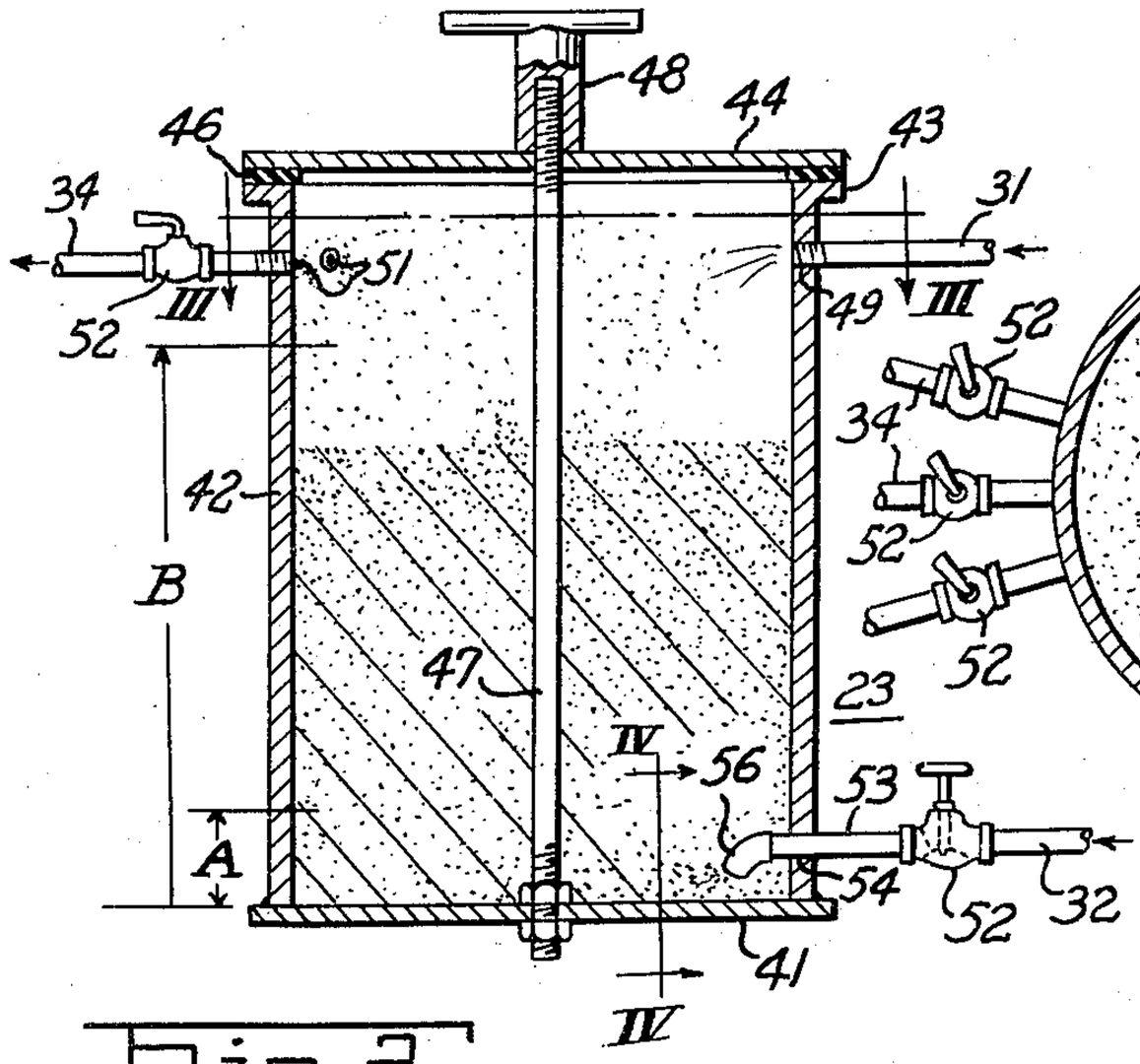


Fig. 2.

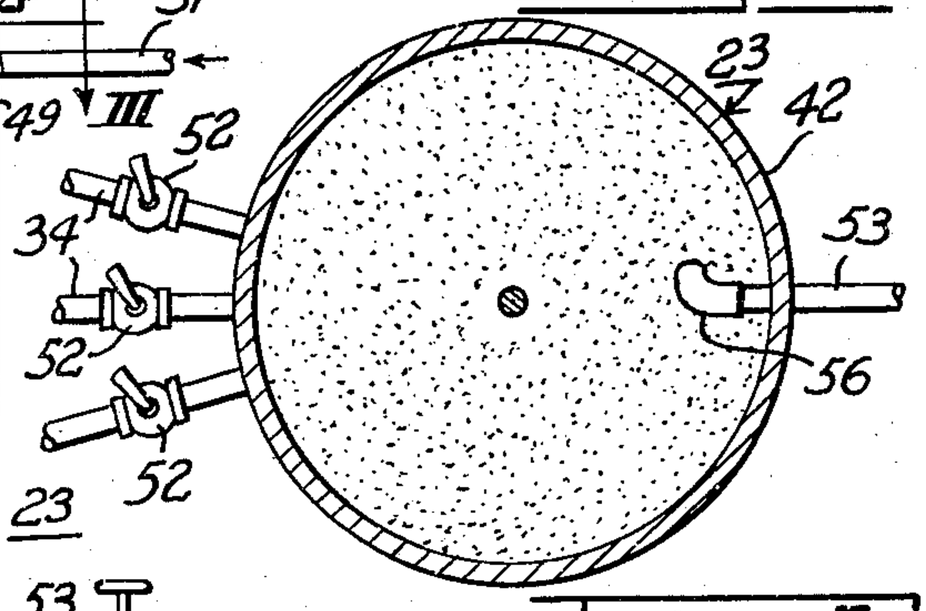


Fig. 3.

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PNEUMATIC DRY POWDER OFFSET ELIMINATOR

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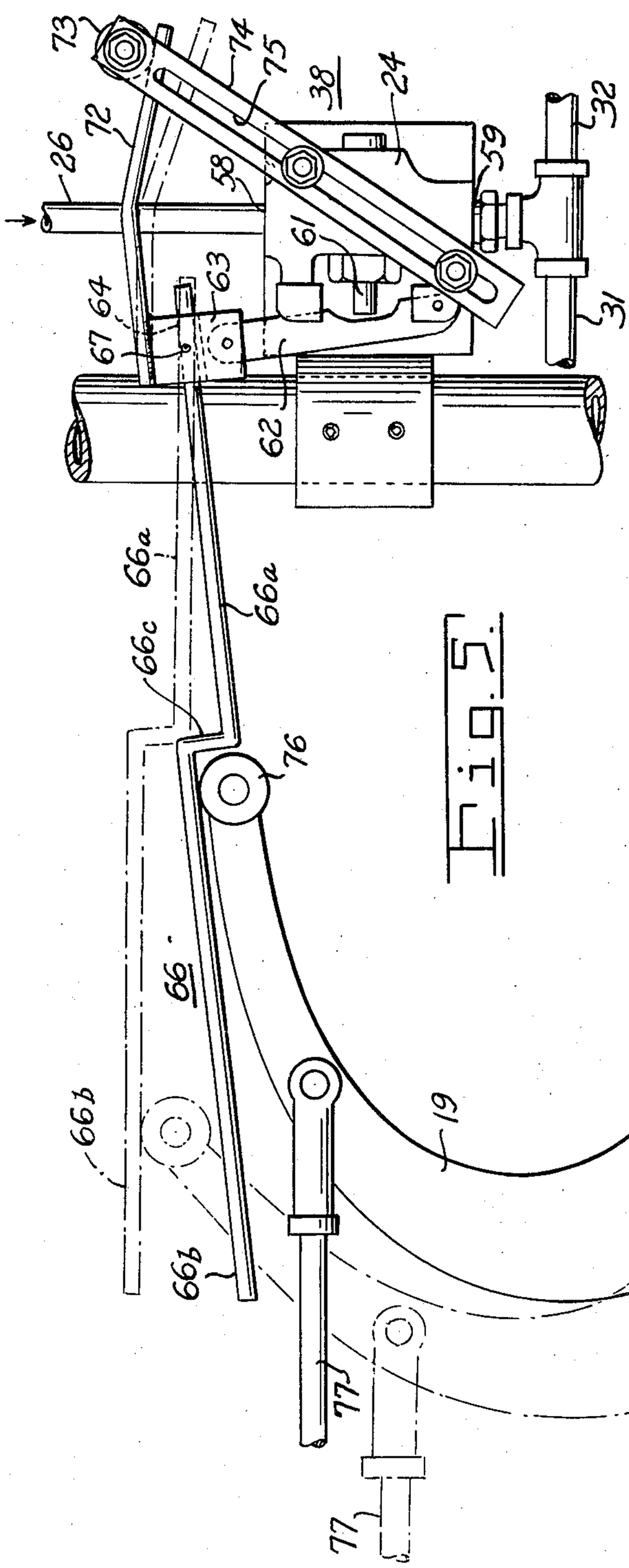

Fig. 5.

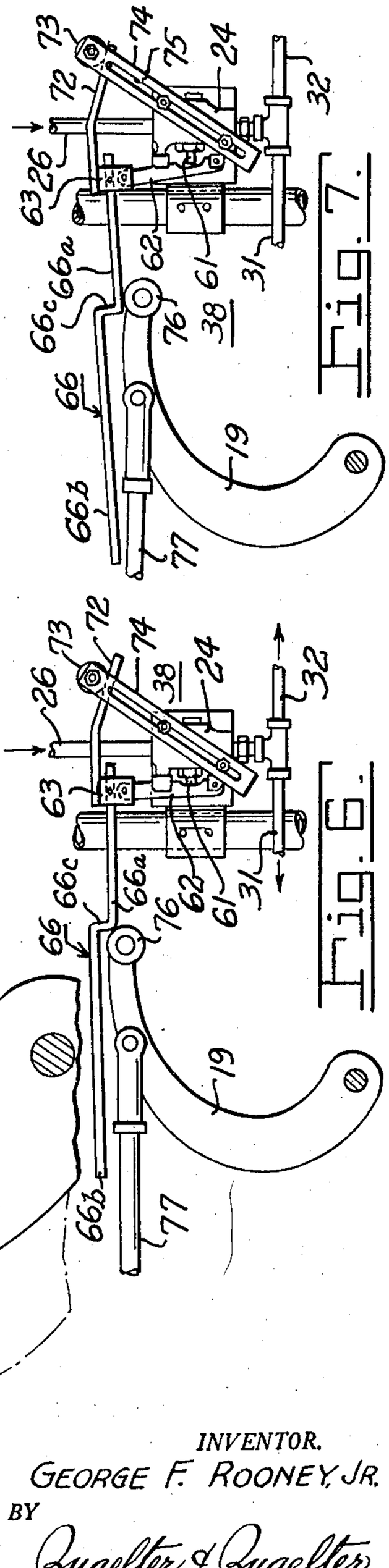

Fig. 7.

Fig. 6.

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PNEUMATIC DRY POWDER OFFSET ELIMINATOR

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2 Claims. (Cl. 222—193)

This invention relates to a device for spraying powder particles on printed sheets as the printed sheets are delivered by a printing press, to prevent undesired offset printing.

An object of this invention is to provide a device for spraying powder having a container in which powder particles are sufficiently agitated to form a mist or suspension in the container at a level above the normal level of the body of powder therein, the mist of powder being discharged from the container into distributing lines from which discrete puffs of powder issue.

A further object of this invention is to provide a device of this type in which air is introduced into a powder container in two streams one into the body of the powder to agitate the same and the other into the air-powder suspension to discharge the same into the distribution lines.

A further object of this invention is to provide a device of this type in which an air inlet line discharges into the lower portion of the container below the powder level in such a direction as to stir the powder by driving the powder circumferentially of the container.

A further object of this invention is to provide a novel and efficient mechanism for operating an air supply valve for the container whereby discrete puffs of powder particles are delivered to printed sheets issuing from the printing press in timed relation therewith and air for agitating the powder is provided.

A further object of this invention is to provide a device of this type having an air line, a valve therein for delivering air to the powder in the container, and a mechanism for operating the valve at timed intervals to effect delivery of discrete puffs of powder particles to printed sheets in timed relation to the delivery of the sheets by the press.

The above and other objects and features of this invention will be apparent to those having ordinary skill in the art to which this invention pertains, from the following detailed description and the drawings:

In the drawings:

Figure 1 is a perspective view showing a powder spraying device constructed in accordance with an embodiment of this invention, the device being shown mounted at the delivery end of a printing press, only a fragmentary portion of the printing press being shown.

Fig. 2 is a view in vertical section of the powder container of the device;

Fig. 3 is a view in section taken on the line III—III in Fig. 2;

Fig. 4 is a fragmentary view in section, taken on the line IV—IV in Fig. 2;

Fig. 5 is an enlarged view in side elevation of the valve and valve operating mechanism of the device illustrated in Figs. 1, 2, and 3;

Fig. 6 is a view in side elevation of the valve and valve operating mechanism in another position; and

Fig. 7 is a view in side elevation showing the valve and valve operating mechanism in a further position.

In Fig. 1 the delivery end of a printing press is indicated at **10**. Details of construction of the printing press are omitted and only as much of the delivery end of the press is shown as is necessary for an explanation of the invention. At the delivery end of the printing press, piles of printed sheets **12** are accumulated on sheet-holding boards **14**. The boards **14** are supported on beams **16** which are gradually lowered as the stack of sheets gets higher and higher. Also at the delivery end of the press are frame members or posts, two of which are indicated at **17** and **18**. The frame member or post **17** supports a crank **19** which swings in timed relation with the delivery of printed sheets. The mechanism described to this point forms a part of printing presses which are presently in common use for printing box board and the like.

On post **17** is mounted a bracket **21** which supports a powder container **23** into the chamber of which air under pressure is delivered by an air valve **24** disposed in an air supply line **26**. The air passes through an air filter **27** and a pressure reducing valve **28**. From the air valve **24**, the air passes through a T-fitting **29** to lines **31** and **32** leading to the upper part and the bottom of the container, respectively. Powder from the container **23** is distributed by powder distributing lines **34** having nozzles **36** at the discharge ends thereof. The nozzles **36** are disposed above the pile of sheets **12** and are arranged to distribute powder on the sheets as they are delivered from the press.

The air valve is actuated by valve operating mechanism indicated generally at **38**, that is actuated by the crank **19**. As the crank **19** swings to the right, as indicated in Fig. 1, the valve is opened to provide an air blast to the container. The air delivered to the bottom of the container agitates the powder and forms an air-powder suspension in the upper part of the container. The air blast delivered by pipe **31** distributes the powder-air suspension to the printed sheets. As the crank **19** swings back to the left, the air supply and consequently the distribution of powder is interrupted. Thus, as the air valve is opened and closed in timed relation with the press, particles of powder are delivered in puffs in timed relation with the stacking of the sheets on the board **14**.

The device which has been described in general terms to this point will now be described in greater detail.

The powder container

The powder container **23**, as illustrated in Fig. 2, includes a flat bottom plate **41** and an upright cylindrical wall **42**. At the upper end of the cylindrical wall **42** is an outwardly extending flange **43**. The powder container is closed by a cap **44** which is sealed to the flange **43** by an appropriate gasket **46**. A stud **47** attached to the bottom plate **41** extends upwardly through the container. A nut **48** on the stud **47** holds the cap **44** in closed position.

The air inlet line **31** communicates with the upper portion of the interior of the container through an opening **49** in the wall thereof. The powder distributing lines **34** communicate with the upper portion of the container through openings **51**. The powder distributing lines are opposite the air inlet opening **49** so that the flow of air from pipe **31** to lines **34** crosses the upper portion of the container. The air inlet opening **49** and outlet openings **51** are horizontal and substantially aligned so that the blasts or puffs of air drive powder mist directly across the upper portion of the container. Cocks **52** are provided in the powder distributing lines, so that, as many of the powder distributing lines may be used as desired or the needs require.

The air supply line **32** has a needle valve **52** therein. From the needle valve **52** air passes through a nipple **53** which extends through an opening **54** in the lower portion of the container. An elbow fitting **56** is mounted on the inner end of the nipple **53**, and, as shown in Figs. 2 and 4, extends downwardly and circumferentially of the container at an angle of approximately 45° to the vertical. Thus, air delivered by line **32** and elbow fitting **56** is discharged downwardly and circumferentially to stir up and agitate the powder in the container so that a mist or suspension of air and powder is formed above the normal level of powder in the container. This mist of powder is discharged to the distribution lines **34**, in the manner stated supra, to the nozzles **36**. As indicated in Fig. 1, nozzles **36** are supported on an appropriate frame **57** which extends above the printed sheets so that the powder is distributed onto the sheets as the sheets are stacked.

The needle valve **52** is opened only slightly, so that the major portion of air passing through the air valve **24** enters through the line **31** to provide a substantial puff for driving air through the lines **34**. The amount of powder that is distributed with each puff may be controlled by adjusting the opening of the needle valve **52** to increase or decrease the degree of agitation of the powder and the density of the powder mist in the upper part of the chamber of container **23**.

Powder is maintained in the container at levels between a minimum level A and a maximum level B (see Fig. 2). At all times there is a chamber space above the powder level in communication with the openings **49** and **51**. In addition, the level of powder is maintained above the elbow **56** so that the powder-agitating air is discharged below the powder level into the powder.

An electric heater **57***a* is attached to the wall of the container and serves to keep the powder in the container warm and prevent condensation of moisture inside the container.

The air valve

The operation of the air valve **24** and the valve actuating mechanism **38** is most clearly shown in Figs. 5–7 inclusive. The air valve **24** has an air inlet **58** and a discharge **59**. A plunger **61** actuates the air valve. The plunger **61**, in turn, is actuated by an upright lever **62** which is pivotally attached at its lower end to the housing of the valve. At the upper end of the lever **62** is pivotally mounted a head member **63**. The head member **63** is provided with a bore **64** through which a rod **66** extends. The rod **66** is Z-shaped and has arms **66***a* and **66***b* and a cross bar **66***c*. Arm **66***a* may be adjusted along the bore **64**. The rod is held in adjusted position by a set screw **67**. Adjustment of the rod along the bore **64** determines the time of the start of powder delivery.

A stop rod **72** is attached to the head member **63** and is engageable with a lug **73**. The lug **73** is mounted on an adjustable bar **74** mounted on the body of the air valve. Bar **74** is slotted, as indicated at **75**, so that the bar **74** can be adjusted to either raise or lower the position of the lug **73**. The stop rod **72** engages the lug **73** when the valve actuating lever **62** and the rod **66** are in the position shown in full lines in Fig. 5. Adjustment of bar **74** determines the end of powder delivery.

The valve-actuating crank **19** is provided with a lug **76** at the upper end thereof. The lug **76** is engageable with the cross bar **60***c* of the rod **66**. The crank **19** is driven by a rod **77**, only a portion of which is shown, forming a part of the printing press mechanism. Rod **77** reciprocates back and forth in timed relation to the delivery of printed sheets and swings the crank **19** with an oscillating motion. Thus, the crank **19** oscillates in timed relation with the operation of the sheet delivery mechanism of the printing press.

When the crank **19** is in the position shown in dot-dash lines in Fig. 5, lug **76** engages arm **66***b* of the rod **66** and holds the rod in raised position. The crank **19** swings to the right to the position shown in full lines in Fig. 5 and through that position to the position shown in Fig. 6 in which the lug **76** engages the cross bar of the rod **66** to urge the rod and the valve actuating lever to the right to actuate the valve and permit air to pass through the valve. As the crank **19** advances farther to the right, the lug **76** passes below the lower end of the cross bar **66***a*, and the rod **66** rides on the crank as shown in Fig. 7, whereupon the valve **24** is closed by actuation of the valve spring (not shown) of the valve. Then, the crank **19** swings back to the left to the position shown in dot-dash lines in Fig. 5, whereupon the cycle is repeated.

Conclusion

As sheets are delivered from the printing press, air is directed into the powder container **23** in puffs, so that, as each sheet is delivered, a puff of powder is distributed to the sheet to coat the sheet and prevent offset printing.

The air valve and piping arrangement provide two supplies of air to the powder container. One supply is directed into the lower portion of the container to stir and agitate the powder so that a mist or suspension of powder is formed in the upper portion of the container. The other air supply is directed into the upper portion of the container and effects delivery of the mist to the nozzles.

The powder used may be of the type usually used in preventing offset printing.

The construction of the device is very simple. However, the device causes uniform delivery of a puff of powder to each sheet, notwithstanding variations in level of powder in the container.

The powder spraying device illustrated in the drawings and described above is subject to structural modification without departing from the spirit and scope of the appended claims.

Having described my invention, what I claim as new and desire to secure by letters patent is:

1. A device for spraying powder particles which comprises an enclosed, upright, hollow, cylindrical, powder-holding container having its interior substantially free of obstructions and having a flat, horizontal bottom plate, powder partially filling the container, a horizontal air inlet in the upper portion of the wall of said container for discharging air across the upper portion of the interior of the container above the level of the powder, a powder distributing line in communication with the interior of the cylinder and positioned in the opposite wall of said container, said distributing line being in substantially the same horizontal plane as the air inlet whereby powder in the container between said air inlet and said powder distributing line is forced through said distributing line, another air inlet adjacent the lower end of the container below the powder level, means attached to the lower air inlet for directing air therefrom circumferentially of the container, means for supplying timed puffs of air to the air inlets whereby powder is stirred and forced between the upper air inlet and the discharging line, means for connecting said air inlets together and means for throttling the flow of air into said lower air inlet to control the degree of agitation of the powder in the container.

2. A device for spraying powder particles as defined in claim 1 in which said lower inlet is directed downwardly and circumferentially of the container.

References Cited in the file of this patent

UNITED STATES PATENTS

1,592,806	Brunell	July 13, 1926
2,257,010	Hildebrand	Sept. 23, 1941
2,496,194	Bennett	Jan. 31, 1950
2,720,342	Fleck	Oct. 11, 1955
2,729,194	Jones	Jan. 3, 1956