May 5, 1953 M. I. DORFAN 2,637,600

PNEUMATIC CONVEYER SUCTION HOOD

Filed July 12, 1951 2 SHEETS--SHEET 1

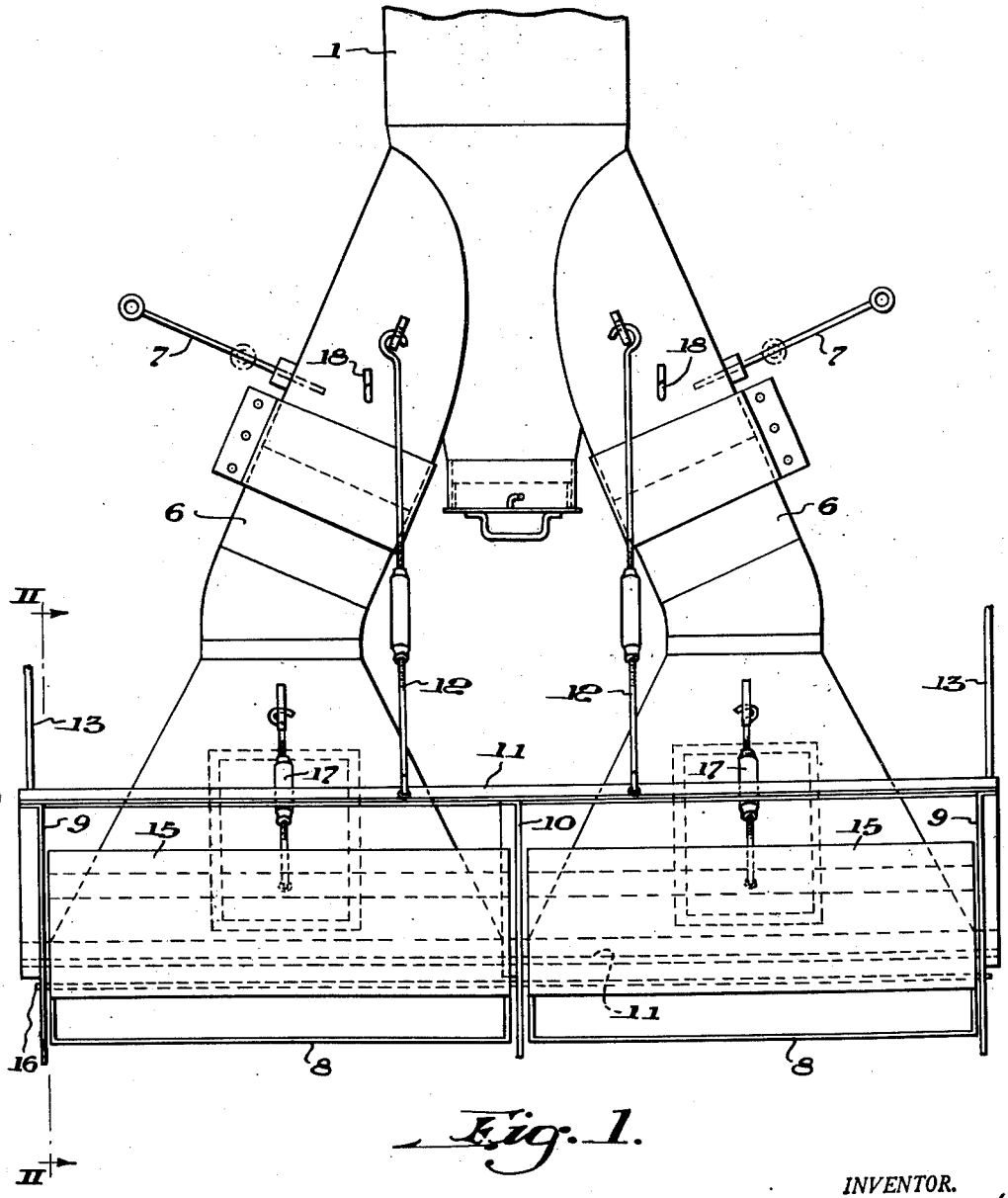

Fig. 1.

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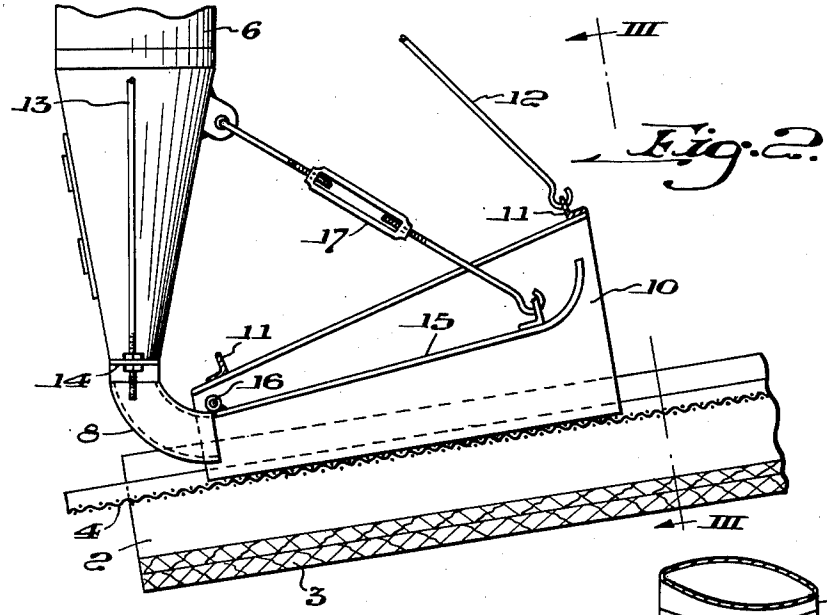

Fig. 2.

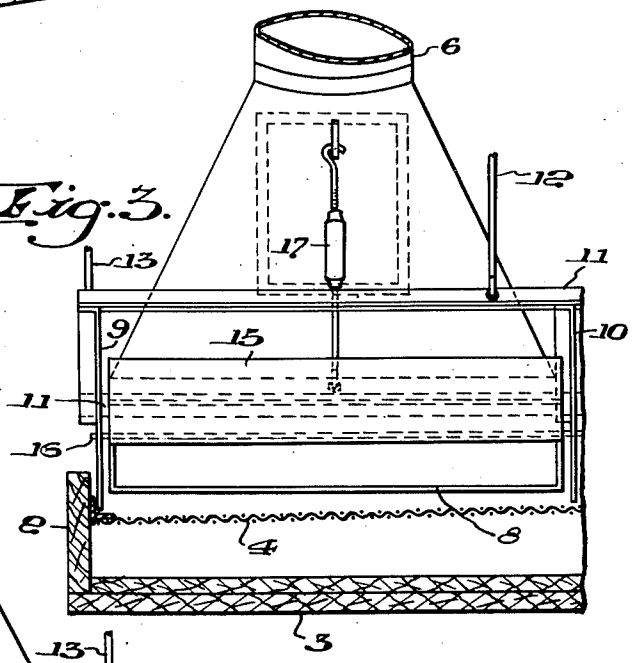

Fig. 3.

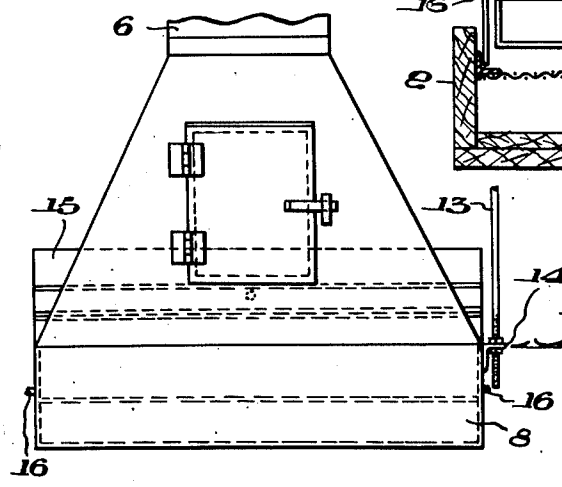

Fig. 4.

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PNEUMATIC CONVEYER SUCTION HOOD

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4 Claims. (Cl. 302—58)

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This invention relates to pneumatic conveyor suction hoods which are used for picking up loose material, such as granular material and fibers, from a moving bed of that material. Such a hood is shown in Patent No. 2,499,301.

It is among the objects of this invention to provide a suction hood which does a better job of collecting the material that is to be conveyed away than earlier hoods, and which does it with less air velocity and a smaller pressure drop.

In accordance with this invention, the hood has a pair of laterally spaced upright side plates, the lower edges of which are adapted to extend lengthwise along a moving bed of loose material that is to be carried away by a pneumatic conveyor. A top plate extends across the space between the side plates above their lower edges and forms with the side plates an open bottom passage having an air inlet at one end of the plates and an air outlet at their opposite end. An upwardly curved elbow is connected to the outlet and to the lower end of a pneumatic conveyor duct above it. Air that is drawn into the passage inlet picks up material from the bed moving lengthwise through the hood and carries it into the elbow and then into the duct. Preferably, the top plate is pivotally mounted on a horizontal axis so that the height of the inlet can be varied. Also, it is desirable to locate the bottom of the lower end of the elbow a short distance above the lower edges of the side plates.

The preferred embodiment of the invention is illustrated in the accompanying drawings, in which Fig. 1 is a front view of a pair of cooperating hoods; Fig. 2 is a vertical section taken on the line II—II of Fig. 1, showing the hood associated with a vibrating table; Fig. 3 is a front view of one of the hoods taken on the line III—III of Fig. 2; and Fig. 4 is a rear view of one hood without the side plates.

Referring to the drawings, a vertical pneumatic conveyor duct 1 is located some distance above the lower end of a longitudinally inclined table. The table is of conventional design, having parallel side walls 2 connected together at their bottom by a bottom wall 3. About half way between the top and bottom of the side walls there is a screen 4 which extends across the table for supporting a bed of loose material, such as fibers or powdered or granular material. Separated asbestos fibers often form such a bed. The table is reciprocated lengthwise by any suitable means in such a manner as to cause the bed on the screen to travel toward the lower end of the table.

From opposite sides of the lower portion of duct

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1 a pair of branch ducts 6 diverge downward and terminate in laterally flared portions which have long, narrow lower ends. The branch ducts are provided with manually adjustable dampers 7. Joined to the lower end of each of these branch ducts is an elbow 8 that curves downward and forward to a point a short distance above the screen near its lower end. The elbow is rectangular in cross section and its lower end preferably lies in a substantially vertical plane.

Adjoining the outer sides of the two elbows at the lower ends are the rear ends of a pair of parallel vertical side plates 9. An intermediate side plate 10 has its rear end located between the adjacent inner sides of the elbows. The lower edges of the three side plates extend up along the screen parallel to it, but the upper edges of the plates are inclined upward and forward relative to their lower edges so that the front ends of the plates are taller than their rear ends. The three side plates are held in position by a pair of parallel angle bars 11 that extend across the front and rear ends of the bent-over tops of the plates. The front bar 11 is supported by rods 12 connected to the upper portions of the branch ducts 6, and the elbows 8 are supported by rods 13 connected to brackets 14 and suspended from any suitable overhead support (not shown). These rods hold the three side plates in position with their lower edges spaced a short distance above the screen so that the screen will not rub against them.

Extending across the space between each pair of side plates 9 and 10 is a top plate 15 or vane which has its rear end mounted on a pivot rod 16 extending across the top of the lower end of the adjoining elbow and into the side plates. This permits the front end of the top plate to be adjusted up or down by means of an adjustable hanger rod 17 that connects the front end of the plate to the adjacent branch duct. The front end of the plate is curved upward. Each pair of side plates and the top plate between them form an open bottom passage having an air inlet at the front end of the plates and an air outlet at the lower end of the adjoining elbow. Although the bottom of this passage is open as far as the hood is concerned, the screen and the bed of loose material on it form a floor for the passage. When it is desired to raise the top plates 15 in order to perform clean-out work or repairs, hanger rods 17 can be unhooked from ducts 6 and hooked onto hooks 18 (Fig. 1) at a higher level, whereby the outer ends of the plates will be swung upward out of the way.

In operation loose material, asbestos fibers for example, is dumped on the upper end of the table

and moves downward over the screen 4 due to the movement of the table. The fibers are shaken out over the screen to form a traveling bed, and sand and other foreign particles mixed with the fibers shake through the screen onto the bottom wall 3 of the table. As the fibers approach the front ends of the suction hooks and travel down through them, the air drawn in through the hoods by duct 1 picks up the fibers and draws them through the elbows and up into the branch ducts. The position of the top plates 15 or vanes determines the velocity of the entering air and thereby the distance in front of the hoods that the air currents will start to pick up the fibers. Due to the fact that the bed of fibers moves lengthwise of the hoods, the fibers are exposed to the suction in the hoods for a much longer time than if they were carried transversely across the lower end of a vertical hood having an inlet no larger than the inlets of my hoods. Since the height of the hood inlets disclosed herein has nothing to do with the distance that any given fibers in the bed can travel through the hoods, the height of the inlets can be maintained small so that the desired velocity of the air can be obtained without large suction. The velocity likewise need not be great, due to the large area of the bed exposed to the suction.

By the time the fibers on the screen have reached its lower end, the only ones remaining on the screen are the clumps of unseparated fibers which are too heavy to be picked up by the air currents. It will be noted that the only inlet to each elbow is at its lower end, facing forward. Some air will be drawn into the rear end of each hood through the space between the lower end of its elbow and the underlying screen. This air helps pick up any loose fibers that may have passed entirely through the hood.

The reason for using two hoods side by side is well known. They distribute the suction more uniformly across the width of the bed than a single wide hood would do.

According to the provisions of the patent statutes, I have explained the principle of my invention and have illustrated and described what I now consider to represent its best embodiment. However, I desire to have it understood that, within the scope of the appended claims, the invention may be practiced otherwise than as specifically illustrated and described.

I claim:

1. A pneumatic conveyor suction hood for picking up loose material from a moving bed, the hood comprising a pair of laterally spaced upright side plates whose lower edges are adapted to extend lengthwise along the bed, a top plate extending across the space between the side plates above their lower edges and forming with the side plates an open bottom passage having an air inlet at one end of the plates and an air outlet at their opposite end, said plate being positioned to give said passage a height that is undiminished from its outlet to its inlet end, and an upwardly curved elbow connected to said outlet and adapted to be connected to the lower end of a pneumatic conveying duct, the inlet of the elbow facing toward the inlet of said passage, whereby air drawn into said passage inlet will pick up material from said bed and carry it in a substantially straight line into said elbow inlet.

2. A pneumatic conveyor suction hood for picking up loose material from a moving bed, the hood comprising a pair of laterally spaced upright side plates whose lower edges are adapted

to extend lengthwise along the bed, a top plate extending across the space between the side plates above their lower edges and forming with the side plates an open bottom passage having an air inlet at one end of the plates and an air outlet at their opposite end, means pivotally connecting the top plate to the side plates on a horizontal axis near said outlet, means for adjusting the opposite end of the top plate vertically to give said passage a height that is undiminished from its outlet to its inlet end, and an upwardly curved elbow connected to said outlet and adapted to be connected to the lower end of a pneumatic conveying duct, the inlet of the elbow facing toward the inlet of said passage, whereby air drawn into said inlet will pick up material from said bed and carry it in a substantially straight line into said elbow inlet.

3. A pneumatic conveyor suction hood for picking up loose material from a moving bed, the hood comprising a pair of laterally spaced upright side plates whose lower edges are adapted to extend lengthwise along the bed, a top plate extending across the space between the side plates above their lower edges and forming with the side plates an open bottom passage having an air inlet at one end of the plates and an air outlet at their opposite end, and an upwardly curved elbow connected to said outlet and adapted to be connected to the lower end of a pneumatic conveying duct, the inlet of the elbow facing toward the inlet of said passage, whereby air drawn into said passage inlet will pick up material from said bed and carry it in a substantially straight line into said elbow inlet, one end of the top plate being pivotally mounted on a horizontal axis at the top of the lower end of said elbow, and the opposite end of the top plate being curved upward, said plate being positioned to give said passage a height that is undiminished from its outlet to its inlet end.

4. A pneumatic conveyor suction hood for picking up loose material from a moving bed, the hood comprising a pair of laterally spaced upright side plates whose lower edges are adapted to extend lengthwise along the bed, a top plate extending across the space between the side plates above their lower edges and forming with the side plates an open bottom passage having an air inlet at one end of the plates and an air outlet at their opposite end, said plate being inclined upward from the outlet to the inlet end of said passage relative to the bottom of the passage, and an upwardly curved elbow connected to said outlet and adapted to be connected to the lower end of a pneumatic conveying duct, the inlet of the elbow being disposed in a plane substantially perpendicular to the bottom of said passage, whereby air drawn into said passage inlet will pick up material from said bed and carry it in a substantially straight line into said elbow inlet, the bottom of the lower end of the elbow being spaced a short distance above the lower edges of the side plates.

MORTON I. DORFAN.

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Number	Name	Date
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2,499,301	Dorfan	Feb. 28, 1950

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