April 11, 1939. E. W. LEICHT 2,153,984

PNEUMATIC CONVEYING PIPE

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Fig. 1

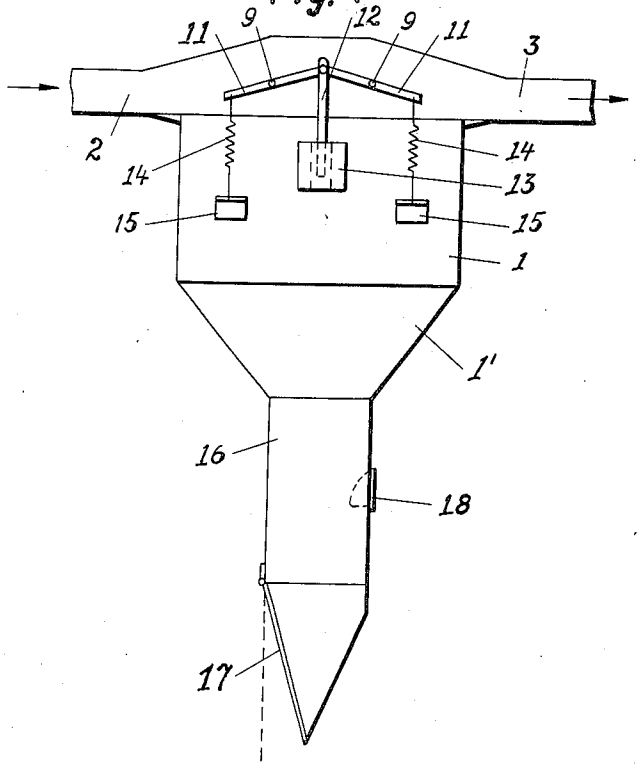
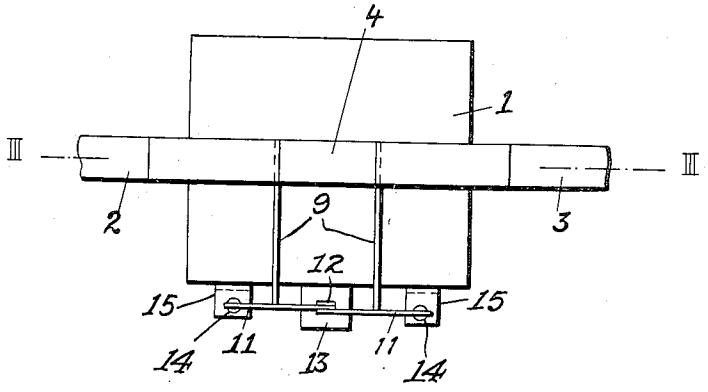


Fig. 2



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Fig. 3

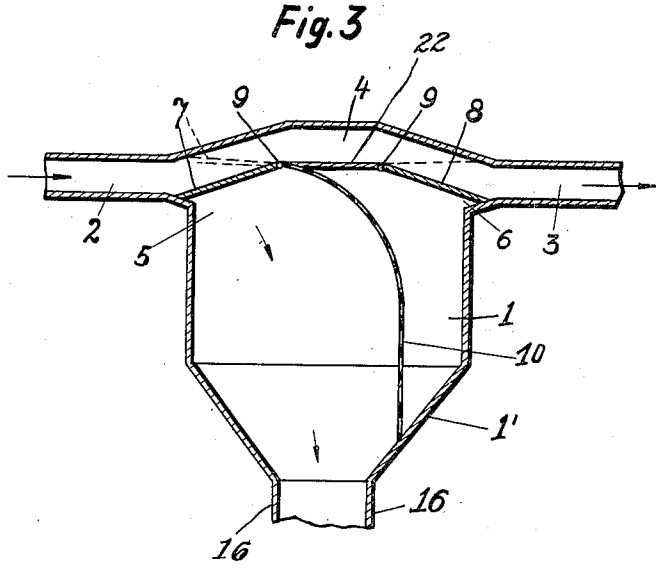
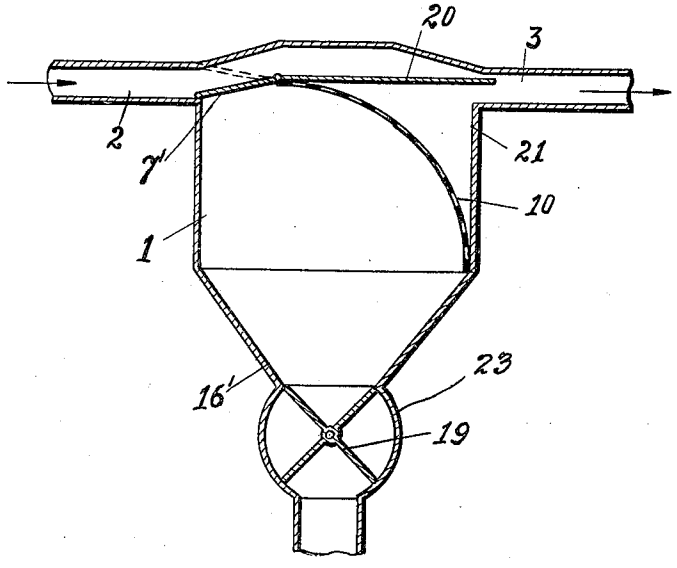


Fig. 4



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PNEUMATIC CONVEYING PIPE

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Application October 26, 1936, Serial No. 107,623
In Germany March 12, 1936

2 Claims. (Cl. 302—59)

The present invention relates to improvements in pneumatic conveying piping for cut tobacco and more particularly to the connection between the conveying piping and a tobacco settling box used in conjunction with a cigarette machine or the like. In this type of device the settling box is connected to the trunk piping by a connection including shut off valves and by-passes by means of which a series of settling boxes may be operated from a single conveyor piping for selectively cutting into the stream of tobacco.

An object of the present invention is to provide a construction in which only a single pipe leads from the tobacco source to a settling box and thence to the dust filter.

Another object is to use the constantly flowing stream through the pipe to clean tobacco depositing in the settling box.

A further object is to employ flap valves in the joint between the settling box, the conveyor piping and the by-pass in which the flap at the inlet side of the settling box is designed to be a projection of the curved sieve used in dividing the settling box so that incoming tobacco and air will flow smoothly and without disturbance into the box where gradual precipitation of the tobacco may take place.

A still further object consists in means for automatically controlling the opening and closing of the valves connecting the settling box with the conveyor piping according to the amount of tobacco in the settling box.

A modified form of this invention consists in connecting the settling box to the conveyor piping with the use of only a single valve and providing means whereby tobacco flowing through the by-pass is prevented from falling into the settling box.

With the foregoing and other objects in view, the invention will be more fully described hereinafter, and will be more particularly pointed out in the claims appended hereto.

In the drawings, wherein like symbols refer to like or corresponding parts throughout the several views,

Figure 1 is a side elevation of the device with the conveyor piping broken away at either end of the settling box.

Figure 2 is a top plan view of the same.

Figure 3 is a vertical section taken on the line III—III of Figure 2, and

Figure 4 is a similar vertical section taken through a modified form of the device.

Referring now to the drawings and particularly to Figures 1, 2 and 3, a tobacco settling box 1 of rectangular shape is mounted below the pneumatic conveyor piping. The piping is interrupted at this point, the pipe 2 leading from the tobacco source, and the pipe 3 leading to the dust filter. Between the ends of the pipes 2 and 3 is placed a connector 4 which extends across the top of the settling box 1. The pipes 2 and 3 open into the top of the settling box 1 as at 5 and 6 shown in Figure 3. Except for these openings the top of the box 1 is closed. The connector 4 has a dividing plate 22 which provides a partition between the upper part of the connector and the settling box 1. At the opening 5 of the settling box is placed a flap valve 7 which is fixed to the rotatable axle 9 journaled in the opposite sides of the connector 4. At the opening 6 of the settling box is placed a flap valve 8 likewise fastened to a rotatable axle 9 journaled in the walls of the connector 4. In the position shown in Figure 3 in solid lines the valves 7 and 8 are closing the openings into the settling box and the stream of tobacco and air is by-passed above the plate 22. When the axles 9 are rotated the valves 7 and 8 may be lifted to the dotted line position so that the entire stream of tobacco and air is delivered into the settling box 1.

The settling box 1 is, as stated above, of rectangular shape. Below the rectangular portion of the box is placed a tapering section 1' which leads to a delivery pipe 16. As seen in Figure 1 the lower end of the delivery pipe 16 is tapered and provided with a gate 17 to regulate flow of tobacco from the delivery pipe. Extending transversely of the settling box 1 and the section 1' is a curved screen 10 the upper end of which is secured to the undeside of the plate 22 adjoining the axle 9 on the inlet side. The lower end of the screen 10 is carried down and attached to the side of the tapered section 1'. The tobacco entering through the opening 5 of the settling box 1 either falls by gravity in the box or else is separated out of the air stream upon the screen 10 where it accumulates and eventually falls into the delivery pipe 16. It has been found to be of value to have the incoming stream of tobacco and air flow as smoothly as possible so that precipitation will be gradual. The present invention provides for this by attaching the flap valve 7 at the end of the screen 10 so that in its raised position the valve 7 forms a continuation of the screen. As seen in Figure 3, this valve 7 in raised position is approximately a tangent to the curve of the screen 10 at its uppermost point. The stream flowing into the box 1 is then led into the

curve of the screen in the most gradual way possible with a minimum of disturbance.

At one side of the connector 4 the axles 9 of the valves 7 and 8 are carried out and extend beyond the side of the box 1. At their outermost ends the axles 9 are rigidly attached to operating arms 11, the adjoining ends of which are each fastened to the movable core 12 of the solenoid 13. To the opposite ends of the arms 11 are attached springs 14 the other ends of which are secured to brackets 15 on the side of the box 1. The springs 14 normally operate to keep the valves 7 and 8 in the by-pass position. When the solenoid 13 is energized the core 12 is drawn inward and the arms rotate to raise the valves 7 and 8 to the dotted position of Figure 3 sending the tobacco and air into the settling box. Figure 1 indicates at 18 a feeler mechanism which may be employed to energize the solenoid automatically whenever the supply of tobacco in delivery pipe 16 drops below a certain amount. The structure of this feeler is well known in the art and may be electrically connected to the solenoid 13 in any of the numerous well known manners.

Referring now to Figure 4 a modification is shown in which but a single flap valve 7' is used. In this form the plate 22 of the connector of the previous form has been replaced by a much longer baffle plate 20 which extends completely across the discharge side of the settling box 1 and partly into the outlet pipe 3. The screen 10 is made shorter and is attached at the lower part of the rectangular box 1. Also the delivery pipe 16 is replaced by the tapered section 16' which leads into the discharge hopper 23 in which are placed the rotating vanes 19.

In this form, where a single valve 7' is used there is a tendency for the tobacco passing in the by-pass to deposit in the space 21 behind the screen 10 and the baffle plate 20 is provided to prevent this taking place. With the plate 20 in position all of the tobacco in the by-pass is carried completely into the outlet pipe 3. As before the valve 7' in upraised position forms an extension of the screen 10 and releases the disturbance on entering the box.

Of course it is to be understood that a battery of cigarette machines may be fed each by one of the above described settling boxes inserted at various points in a single pneumatic conveyor piping. Thus the pipe 2 may connect to the pipe 3 of a preceding machine in the series and similarly the pipe 3 may connect to the inlet pipe 2 of the next machine. At the ultimate end of the outlet side is placed a suction fan and a dust filter while at the inlet end of a series the shredded tobacco is fed into the indrawn air stream.

It is obvious that various changes and modifications may be made in the details of construction and design of the above specifically described embodiment of this invention without departing from the spirit thereof, such changes and modifications being restricted only by the scope of the following claims.

What is claimed is:

1. In a pneumatic tobacco conveyor, a tobacco settling box having a transverse separating screen therein, an inlet pipe opening into one side of the box at its upper portion, an outlet pipe opening into the box at the opposite side of the upper portion, a connector extending between the inlet and outlet pipes across the top of the box and opening into said pipes at their connections with the box, a valve at the inlet pipe connection selectively to open the box or the connector to the inlet pipe and a baffle at the outlet pipe connection extending into the pipe for a distance to prevent tobacco flowing through the connector from entering the box through the outlet pipe opening, said connector acting as a by-pass to cut out the settling box in one of the positions of said valve.

2. In a tobacco settling box for cigarette-making machines having an opening at its bottom for the discharge of the tobacco, a cover, an intake pipe at one side and an outlet pipe at the other side of the box in substantial alignment with the intake pipe, the combination of a partition parallel with the cover and spaced therefrom, a curved separating screen in the settling box having one end forming an acute angle with the partition and extending from one side of the axis of the box to the other side thereof towards the discharge opening of the box, the apex of the angle being in substantial alignment with the intake and outlet pipes, a valve hinged at the apex of the angle of the screen and partition, in its raised position substantially tangential to the curved screen so as to form a continuation of said screen, and forming a continuation of the upper wall of the intake pipe, and in its dropped position disposed angularly to the curved screen, and forming a continuation with the lower wall of the intake pipe, and means at the outlet pipe connection to prevent tobacco from entering the settling box through the outlet pipe, whereby the induced air in the intake and outlet pipes moves the tobacco through the same and over the valve and partition and said last-named means, when the valve forms a continuation of the lower wall of the intake pipe, and the tobacco is shut off from the outlet pipe when the valve is tangential to the screen and forms a continuation of the upper wall of the intake pipe, said valve and curved screen guiding the tobacco to the lower part of the settling box under the induced air flow from intake pipe through the screen to the outlet pipe.

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