

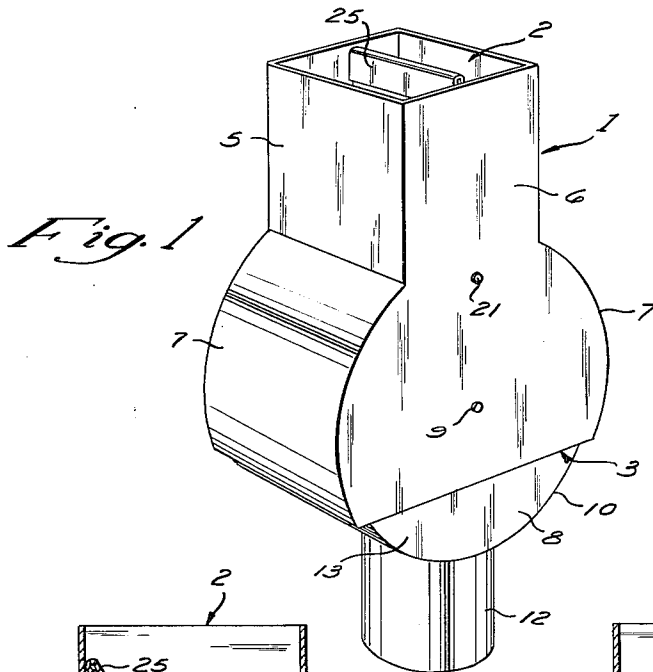
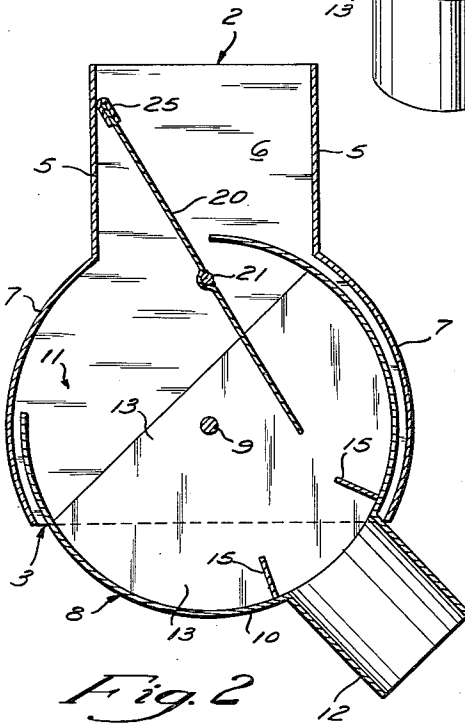
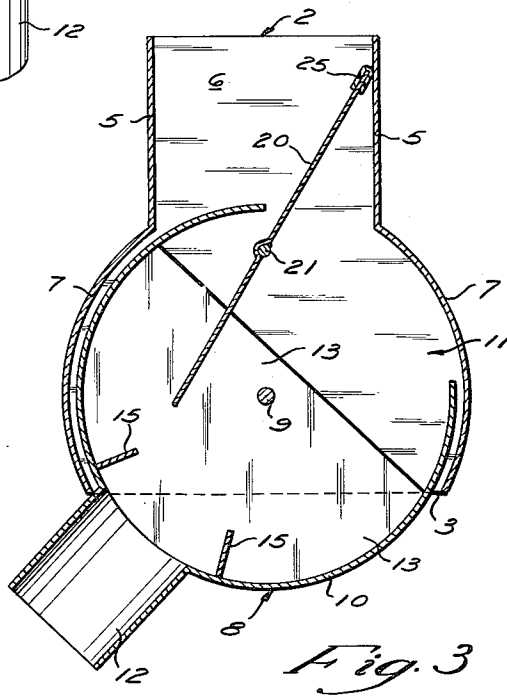
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AIR STREAM OSCILLATING DEVICE

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AIR STREAM OSCILLATING DEVICE

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This invention relates to the fluid controlling art and is particularly concerned with a new device for automatically oscillating a stream of air.

There are numerous places in which air streams are used and where it is desirable to move the air streams through limited arcs, that is, to oscillate them. One such use is in removing lint from looms where it is desirable to move downwardly directed air streams back and forth at right angles to the direction of travel of the blower. Such a stream will move parallel to the warp when the blower is at rest. By oscillating the stream in this manner, lint may be removed from or prevented from collecting on the loom from the warp roll to the harness or from the harness to the cloth.

The present invention aims to provide a new device which will operate automatically to oscillate a stream of air through a short arc and which will be useful for various purposes and particularly in cleaning looms and other textile machines.

In the drawings accompanying and forming a part of this specification:

Figure 1 is a perspective of one embodiment of the invention; and

Figures 2 and 3 are longitudinal cross sectional views of the device of Figure 1 showing certain parts of that device at the ends of their strokes.

In the drawings, 1 indicates a hollow shell which is opened at each end, as indicated at 2 and 3. In its preferred form, shell 1 has a substantially rectangular upper end formed by side walls 5 and end walls 6 for ready attachment in telescoping relation with a substantially rectangular discharge outlet from a blower casing to receive air under pressure therefrom. In its lower portion, shell 1 has opposed arcuate sides 7 which are continuations of sides 5.

A hollow cylinder 8 is disposed within the shell and is mounted for rotation about rod 9. This cylinder comprises a cylindrical wall 10 having an opening 11 in its upper side, an outwardly extending nozzle 12 opposite to opening 11 and projecting through the lower open end 3 of the shell and ends 13. The wall 10 lies in close proximity to the arcuate walls 7 of the shell and the ends 13 lie close to end walls 6 of the shell. Baffles 15 project inwardly a radially short distance from the inner surface of wall 10 of the cylinder on opposite sides of the outlet nozzle 12. It will be understood from the foregoing description that the hollow shell may rotate about its axis 9 to the extent permitted by engagement of the nozzle 12 with the lower ends of side walls 7. In other words, the cylinder will oscillate between these extremes and an air stream flowing through the nozzle will be oscillated thereby.

A butterfly 20 is rotatably mounted on a rod 21 which is substantially parallel to rod 9, is disposed within the cylinder and above the upper extremity of end walls 13 of the cylinder. Thus, the axis of rotation of the butterfly is substantially parallel to the axis of rotation of the cylinder. The upper end of butterfly 20, that is the part be-

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tween the rod 21 and the end which engages with sides 5 is longer than the lower end.

Butterfly 20 extends downwardly from its axis of rotation to a point adjacent to the inner edges of baffles 15 and extends upwardly from rod 21 through the opening 11 in side wall 10 of the cylinder and its upper end carries a striker 25 to engage the side walls 5 of the shell. This striker is employed primarily to deaden the sound which, otherwise, would be made if the butterfly and shell were constructed of sheet metal and the butterfly was brought sharply into contact with the shell. The striker may be made of plastic, rubber, fabric or in general any material which will resist the impact forces applied to it and will deaden the sound of impact of butterfly and shell.

The butterfly 20 is shorter, measured lengthwise of its pivot 21, than the axial interior length of the cylinder. Thus, when air under considerable pressure and velocity flows into the shell 2 and thence into the cylinder 8, the interior of the cylinder may be filled with air under some pressure, and as a result the air stream issuing through the outlet nozzle 12 will be under a positive pressure and may be moved at a velocity comparable thereto.

The operation of the illustrated apparatus will be readily understood from the drawings, but may be described succinctly as follows.

Assuming that the parts are in the position shown in Figure 2 and that air under positive pressure and corresponding velocity is entering the upper end of shell 2, some of this air impinges against the butterfly 20 and is directed downwardly into the cylinder 8 between the butterfly and the adjacent edge of the cylindrical wall 10 which in part defines opening 11. This air impinges against the upper side of the right hand baffle 15 and imparts a force thereto which causes the cylinder to rotate about its axis 9. As the cylinder rotates, the left hand edge of the cylindrical wall 10 also partly defining opening 11 engages the underside of butterfly 20. Since, at that time, the cylinder is moving fairly rapidly, the cylinder will deliver a blow to the butterfly and move it clockwise around its pivot 21 with sufficient velocity to carry the butterfly beyond a vertical line passing through pivot 21 and beyond the edge of the cylinder. As the butterfly moves beyond that vertical line, the air stream will exert more pressure on the left side of the butterfly than on the right side thereof, and as a result the butterfly will be moved to the position shown in Figure 3. As the butterfly approaches the position shown in Figure 3, the air stream will be diverted against the upper side of the left hand baffle 15 with resultant rotation of the cylinder counterclockwise from the position shown in Figure 3 to the position in Figure 2 for the same reasons as were just stated for rotation of the cylinder from the position shown in Figure 2 to that shown in Figure 3.

While the illustrated apparatus is shown with the parts in a vertical position and has been so described, it is to be understood that the devices embodying the present invention need not be mounted in such a vertical position but, on the contrary, may be mounted horizontally and at various angles to the vertical, since it is the air stream flowing through the device which causes it to function automatically.

Having thus described this invention in such full, clear, concise and exact terms as to enable any person skilled in the art to which it pertains to make and use the same, and having set forth the best mode contemplated of carrying out this invention, I state that the subject matter which I regard as being my invention is particularly pointed out and distinctly claimed in what is claimed, it being understood that equivalents or modifications for, or substitutions for, parts of the above specifically described embodiment of the invention may be made without de-

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parting from the scope of the invention as set forth in what is claimed.

What is claimed is:

1. Apparatus for use in oscillating an air stream comprising a shell open at each end, a hollow cylinder mounted for rotation in said shell, said cylinder having an opening in one side wall to receive air under pressure from one end of the shell and an outlet nozzle projecting through the other end of the shell, and means for oscillating said nozzle, said means including baffles in the cylinder and a deflector positioned in the shell and movable to direct an air stream alternately against said baffles.

2. Apparatus for use in oscillating an air stream comprising an open-ended shell, a hollow cylinder mounted for rotation in said shell, said cylinder having an opening in one side wall to receive air under pressure from one end of the shell and an outlet nozzle projecting through the other end of the shell, and means for oscillating said nozzle, said means including baffles projecting inwardly from the cylinder on opposite sides of said nozzle and a deflector oscillatable about an axis within the cylinder and substantially parallel to the axis of rotation of the latter and positioned to direct a stream of air into the cylinder and alternately against said baffles.

3. Apparatus for use in oscillating an air stream comprising a shell open at each end and having opposed arcuate sides at one end, a hollow cylinder mounted for rotation in said shell between said arcuate sides, said cylinder having an opening in one side wall to receive air under pressure from one end of the shell and an outlet

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nozzle projecting through the other end of the shell, baffles extending radially inwardly from the cylinder on opposite sides of said outlet nozzle, and a butterfly carried by the shell for oscillation about an axis within the cylinder and substantially parallel to the axis of rotation of the latter, said butterfly extending from adjacent to the inner edges of said baffles out through the opening in the side of the cylinder.

4. Apparatus for use in oscillating an air stream comprising a shell open at its upper and lower ends and having opposed arcuate sides in its lower position, a hollow cylinder mounted for rotation in said shell between and disposed in close proximity to said arcuate sides, said cylinder having an opening in one side wall to receive air under pressure from the upper end of the shell and an outlet nozzle projecting through the lower end of the shell, baffles extending radially inwardly from the cylinder on opposite sides of said outlet nozzles and a butterfly carried by the shell for oscillation about an axis within the cylinder and substantially parallel to the axis of rotation of the latter, said butterfly extending from adjacent to the inner edges of said baffles up through the opening in the side of the cylinder, and into the upper portion of said shell, said cylinder when oscillated engaging and rotating said butterfly.

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