Dec. 30, 1969 J. F. KING, JR 3,486,184

PULSATION TYPE TRAVELING CLEANERS AND THE LIKE

Filed Dec. 4, 1967 2 Sheets-Sheet 1

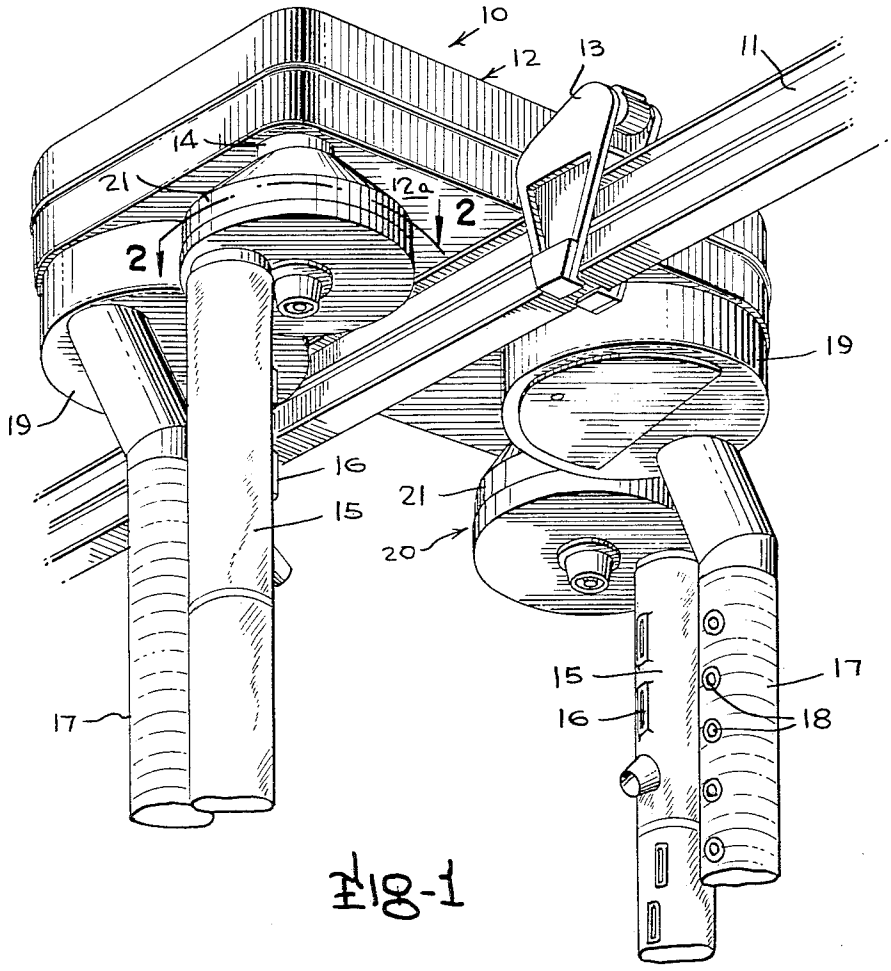


Fig 1

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PULSATION TYPE TRAVELING CLEANERS AND THE LIKE

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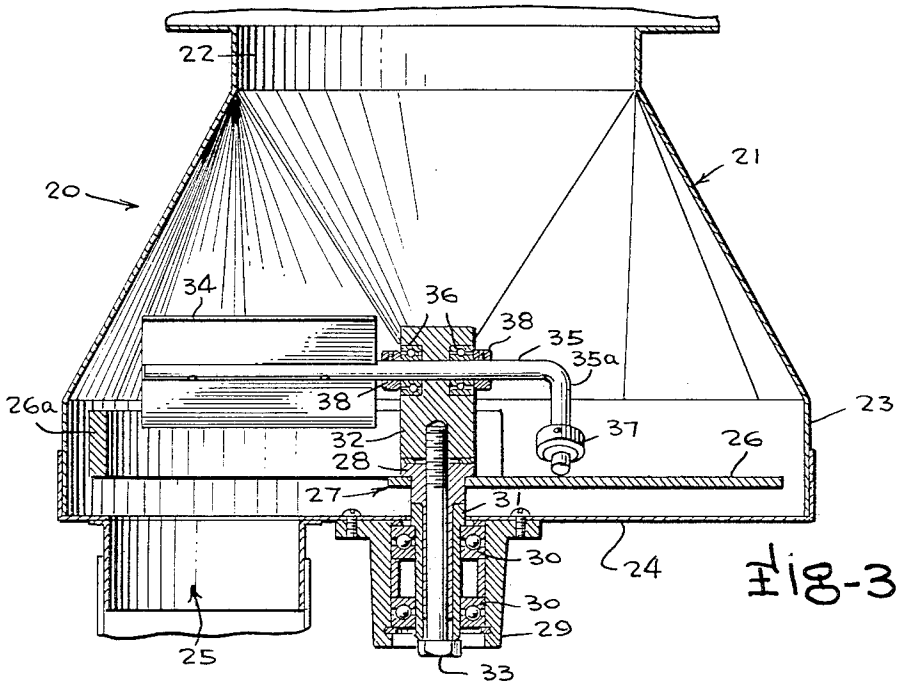


Fig-3

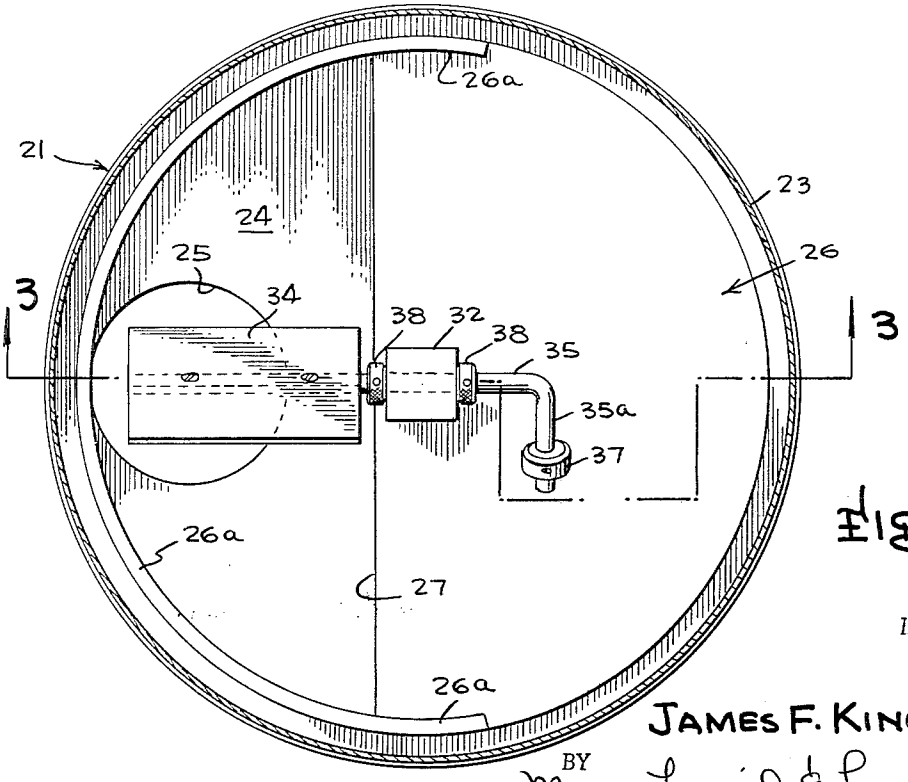


Fig-2

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3,486,184

PULSATION TYPE TRAVELING CLEANERS AND THE LIKE

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Int. Cl. A47l 5/14
U.S. Cl. 15—312 7 Claims

ABSTRACT OF THE DISCLOSURE

A traveling cleaner of the depending trunk type for removing lint and the like from spinning frames and similar textile machines, wherein a blower housing traveling on an overhead trackway above the machines supplies air to one or more depending blower trunks having nozzles for discharging high velocity air streams toward the machine, and air pulsating means cyclically shuts off and opens the air supply to the blower trunk to produce pulsating blasts of discharge air from the nozzles. The air pulsating means may be air driven by a rotatable vane in the air stream supplied to the blower trunk whose angle of attack relative to the air stream varies with variation in speed of rotation.

The present invention relates in general to traveling cleaners for textile machines, especially textile spinning frames, for removing lint, dust and other loose material from the machines and the surrounding floor area, and more particularly to traveling air blast cleaners designed to travel on a trackway located above and along one or more spinning frames or rows of spinning frames and discharge air in high pressure, high velocity blasts or streams from nozzles of depending blower or discharge trunks directed toward selected parts of the spinning frames to clear off the exposed surfaces of the machinery. Such traveling cleaners may also include customary suction trunks to collect the lint and other undesirable material upon its dislodgment from the machinery. The invention also includes the provision of a novel revolving air pulsating device associated with the entrance ends of each of the air discharge trunks, including an air driven vane which is caused to rotate by the air stream supplied to the discharge trunk and has its attitude or angle of attack relative to the air stream varied with variation in speed of rotation.

Much effort has been directed to the removal of lint, dust and other loose, undesirable material from textile processing machines such as spinning frames, looms and the like, and the surrounding area in spinning rooms of textile mills, as this material, if allowed to remain on or near the machines, reduces the quality of the textile product when it is drawn into the product and constitutes a continuing fire hazard in the textile mill. The technique usually employed to remove the lint, dust and like material from the spinning frames or similar textile machines is to traverse rows of the machines with a traveling blower device which is automatically driven along an overhead track and has a depending air discharge or blower trunk along each side of the machine to direct air blasts continuously emanating from the trunk against various parts of the machinery and dislodge the lint therefrom. The dislodged lint is usually allowed either to settle on the floor where it is eventually collected by manual sweeping or by manually operated suction devices, or is removed by traveling blower systems which pneumatically propel the settled material along the floor under groups of machines to a suction collection duct system, or by traveling suction systems usually in the form of a depending suction trunk extending from the

overhead cleaner device to effect suction entrainment and withdrawal of the settled lint material from the floor and the surrounding regions of the machines.

Whereas these prior art traveling cleaner devices cause the air to be discharged from the blower trunk or the plurality of nozzles thereon at a constant air velocity, the present invention differs therefrom by pulsating the air supply to the blower trunk or trunks to cause the cleaning air velocity of the air discharged therefrom to alternate from a relatively low to a relatively high value at a predetermined frequency.

The pulsating stream of discharged air directed against the surfaces of the spinning frame provide superior cleaning performance because the pulsating variation in cleaning air velocity effects improvement in air dislodgement of the contaminants, reducing the quantity of air that needs to be supplied to the blower trunk and permitting better utilization of fan horse power in the fan or air impeller required for the traveling cleaner. The means for achieving pulsation of the air discharged from the blower trunk, in the present invention, avoids the increased cost and complexity which would be introduced by additional motorized facilities for pulsating the air, by employing a rotating vane and valve assembly which is driven by the high pressure air supplied to the entrance end of the blower trunk to effect periodic opening and closing of the upper entrance of the trunk so as to pulsate the air supplied into the trunk for discharge therefrom. In the specific structure herein disclosed, this air driven pulsating means is so constructed that the attitude or angle of attack of the vane which is driven by the air being supplied to the blower trunk inlet varies as the speed of the rotating vane or valve structure varies to achieve improved performance by maintaining a substantially constant pulsation frequency.

An object of the present invention, therefore, is the provision of an improved traveling cleaner of the depending trunk type for dislodging lint, dust and other loose material from textile machinery such as spinning frames, which enhances lint dislodgment by blowing pulsating air blast currents thereagainst.

Another object of the present invention is the provision of novel traveling air blast cleaner devices of the depending trunk type employing a unique air driven valve device at the inlet to the air discharge trunk for pulsating the air streams to be discharged from the trunk.

Another object of the present invention is the provision of a novel rotating vane and air damper structure in association with air blast trunks designed to blow lint, dust and other loose material from textile processing machinery, wherein the attitude or angle of attack of the vane which drives the rotating assembly varies with the speed of rotation of the assembly to effect selected variation of the rotary thrust imparted to the assembly by the air stream.

Other objects, advantages and capabilities of the present invention will become apparent from the following detailed description, taken in conjunction with the accompanying drawings illustrating a preferred embodiment thereof.

In the drawings:

FIGURE 1 is a fragmentary perspective view of a traveling air blast cleaner embodying the air pulsating means of the present invention;

FIGURE 2 is a horizontal section view to somewhat enlarged scale through the air pulsating device of the traveling cleaner, taken along the line 2—2 of FIGURE 1;

FIGURE 3 is a vertical section view taken along the line 3—3 of FIGURE 2.

Referring to the drawings, wherein like reference characters designate corresponding parts throughout the sev-

eral figures, there is shown a traveling air blast cleaner, indicated generally by the reference character **10**, which generally corresponds to the construction of conventional depending trunk type traveling cleaners designed to travel along an overhead rail structure or trackway **11** extending longitudinally of a spinning frame or row of longitudinally aligned spinning frames and achieve lint dislodgment from the spinning frame and collection of dislodged lint as the traveling cleaner moves along the overhead rail structure. As will be appreciated by those familiar with this art, such overhead trackways usually extend along a closed sinuous path having a straight leg for each of the respective rows of spinning frames in a spinning room connected at the ends of adjacent rows by a 180° bend in the trackway, so that a traveling cleaner moving along the track periodically travels over each of the spinning frames to clean them. The traveling cleaner, in accordance with conventional practice, includes an overhead blower housing **12** of generally rectangular configuration which is substantially centered transversely over the trackway and has sufficient width transversely of the spinning frames to dispose the lateral ends or sides of the housing substantially over the aisles flanking the rows of spinning frames. The housing **12** may be a self-propelling unit, if desired, but in the herein-disclosed embodiment is a towed structure drawn by a motorized tractor **13** which is coupled to the blower housing **12** by a drawbar (not shown) so as to push or pull the housing **12** along the trackway and hence along the row of spinning frames. The motorized tractor may be, for example, of the construction described and illustrated in detail in my earlier U.S. Patent No. 3,245,103, granted Apr. 12, 1966, wherein the tractor includes an electrical drive motor furnished with electrical power from electrified conductor rails of conventional construction extending parallel with the trackway, for example, along the side of the trackway, which are engaged by contact brushes on the tractor to supply electrical energy to the motor of the tractor **13**.

The blower housing **12** includes a motor driven blower, such as a bladed blower rotor or air impeller, and an associated blower scroll so designed as to produce high pressure, high velocity air discharge conditions at an air discharge opening **14** located at each side of the housing **12** to supply high pressure air to depending blower trunks **15** extending downwardly from the overhead blower housing **12** to substantially floor level in the aisles along each of the opposite sides of the spinning frames in a row of spinning frames. The blower trunks preferably have air discharge nozzles **16** directed inwardly at various selected positions and angles to discharge air streams transversely inwardly against the sides of the spinning frames so as to dislodge lint therefrom. The blower scroll in the blower housing **12** may also be designed to provide suction conditions at suction inlet openings in the lower wall **12***a* of the blower housing at each side thereof to produce suction conditions in low pressure suction trunks **17**, respectively disposed adjacent the blower trunks **15** having intake nozzle structure at the bottom of the suction trunks **17**, located adjacent the floor level for sucking up such lint and trash as may be present and including, if desired, a vertical series of spaced intake nozzles **18**, located at the general level of the drafting rolls on the spinning frame for sucking in air borne lint fly. While the specific structure of the scroll work in the blower housing **12** and the air impeller associated therewith, as well as the specific location and structure of the blower trunks **15** and suction trunks **17**, may take many desired forms well known to the art, a particularly satisfactory example is disclosed in detail in my earlier U.S. Patent No. 3,245,103, granted Apr. 12, 1966, or in U.S. Patent No. 3,276,065, granted Oct. 4, 1966, jointly to Agnew H. Bahnson, Jr., and the inventor of the present application. It will be noted that in this specific example of the blower housing structure, the suction trunks **17** communicate with the housing **12** through a pair of lint storage canisters **19**, depending from each side of the overhead blower housing **12**, having screens therein which function to strip the lint from the suction air stream carried upwardly through each of the low pressure suction trunks **17** to the suction intake opening in the blower housing **12**.

Reference may be had to either of the above mentioned earlier U.S. patents for more complete disclosure of the details of construction of the air impeller and scroll work and the link storage canisters incorporated in the blower housing **12**.

Traveling air blast cleaners of the general type hereinabove described have customarily been designed to deliver a steady stream of air of substantially constant pressure and velocity to the depending blower trunks and to discharge this air from the trunk nozzles in a steady stream toward the portions of the spinning frame from which it is desired to dislodge the lint. The traveling cleaner of the present invention differs from such prior art cleaners by delivering the high pressure, high velocity air to the depending blower trunks **15** in an intermittent cyclic or pulsating supply of air so that the air will be discharged from the blower trunk nozzle **16** as pulsating or intermittent blasts of air of short duration. Such on and off operation or pulsation of the air discharge from the blower trunk nozzles effects superior lint dislodgment from the spinning frame surfaces intercepting the air blasts as compared with constant air delivery, apparently due to the rapid change in air velocity of the discharge stream. By using such a harmonically pulsating discharge air stream to dislodge the lint, significant reduction can be achieved in the air delivery requirements compared with delivery under free flow conditions as with the constant air delivery type of cleaner, to achieve comparable lint dislodging results, thus permitting better utilization of fan horsepower.

While a number of different means can be employed for effecting pulsation of the air supply to the blower trunks **15**, one form of air pulsating means which has been found to be particularly desirable is illustrated in detail in FIGURES 2 and 3, wherein a rotating valve plate and centrifugally controlled windmill type device interposed between the respective blower trunks **15** and their associated air discharge opening **14** is driven by the air stream passing from the blower housing **12** to the trunks **15**, which is adjustable in speed and reasonably balanced in all attitudes for minimum vibration. This air pulsating unit is indicated generally by the reference character **20** and is constructed in the form of a truncated, conical casing **21**, having a constricted circular top **22** supported from the bottom wall **12***a* of the blower housing **12** in direct communication with the high pressure air discharge opening **14**. The larger diameter circular lower region **23** of the casing **21** is closed by a bottom wall **24** having an outlet opening **25** to which the upper inlet end of the associated lower trunk **15** is joined. Within the lower region **23** of the casing **21** is a pulsator plate **26** serving as a valve member, having a relieved portion or opening **27** adapted to cyclically pass over the outlet opening **25** for periodically admitting the high pressure, high velocity air delivered to the top or inlet opening **22** of the casing to the outlet opening **25** thereof connected to the blower trunk **15**. This pulsator plate may conveniently take the form of a semi-circular plate which is bearing mounted to rotate freely above the bottom wall **24** of the casing **21**. The pulsator plate **26** in the construction herein illustrated is rigidly fixed to a bushing **28** which in turn, is extended downwardly through a center opening in the casing bottom wall **24** and through a bearing housing **29** fastened, as by suitable screws or bolts, to the bottom wall **24**. In the form herein illustrated, the lower region of the bushing **28** is of constricted diameter relative to the upper portion and is located in the bearings **30** of the bearing housing **29** by adaptor sleeve **31**.

A bearing mount **32** is rigidly attached to the bushing

28 above and in coaxial alignment with the latter by a bolt 33 to rotate with and on the center line of the pulsator plate 26. An air driven vane structure is supported on the mount 32 to rotate about the vertical center axis of the bolt 33 and pulsator plate 26 and also to rotate through a limited angle about an axis extending radially of or perpendicular to this vertical axis, and to this end comprises a blade or vane member 34 rigidly attached to a blade shaft 35 which extends through and is journaled for free rotation in bearings 36, which are located in the upper portion of the mount 32 with the center line through the two bearings 36 being as perpendicular as possible to the bolt 33. The end of the shaft 35 opposite the blade or vane 34 is bent at a 90° angle to provide a right angle extension 35*a* on which a weight 37 is mounted, here shown as an annular weight fixed to the shaft extension 35*a* by a set screw. The shaft 35 is restrained against axial displacement relative to the bearings 36 by suitable collars 38 affixed to the shaft by set screws.

When the rotatable pulsator plate 26 and the mount 32 assembled therewith are at rest, it will be apparent that the weight 37 causes the shaft 35 to be rotated within the bearings 36, responsive to the force of gravity on the weight 37, to a position where the extension 35*a* carrying the weight 37 rests on the pulsator plate 26. The blade or drive vane 34 is so located on the shaft 35 that, when the shaft 35 assumes this position with the extension 35*a* resting on the pulsator plate 26, the blade 34 assumes an angle of approximately 45° to the incoming air entering the entrance end 22 of the casing 21. The blade 34 is therefore in a position to offer considerable rotative thrust to the entire bearing mounted assembly. The force of the air stream against the blade or drive vane 34 imparts rotation to the bearing mounted assembly of the blade 34, shaft 35, mount 32, and pulsator plate 26, and as rotation speed is gathered, the weight 37 has a tendency to be thrown outward by centrifugal force, rotating the shaft 35 about its axis within the bearings 36 in an angular direction to cause the blade or vane 34 to be feathered down toward a zero angle of attack relative to the incoming air stream until its thrust, which is diminished by this action, balances the rotational drag of the assembly at the desired speed. A rotational speed of about 200 to 250 revolutions per minute has been found to produce good results for pulsation cleaning.

It will be apparent, therefore, that by the above described construction, the high pressure, high velocity air being delivered from the blower of the blower housing 12 through the discharge opening 14 to the inlet 22 of the air pulsating unit 20 at each side of the housing imparts rotation to the blade or drive vane 34 and consequently to the pulsator plate 26 to cause the pulsator plate 26 to periodically open and close the outlet 25 leading to the blower trunk 15, to thereby periodically pulsate the air supply to the blower trunk and thus the air discharge through the blower trunk nozzle 16. The effect of this is to alternately shut the air off from the blower trunk and then allow it to return in a pulsating fashion and thereby discharge intermittent or pulsating blasts of air from the blower trunk nozzles 16, which more effectively dislodge the link from the intercepting surfaces of the spinning frames than would a constant velocity air discharge stream.

As illustrated in FIGURE 2, appropriate counterbalancing of the pulsator plate 26 may be achieved, if the plate is of semi-circular configuration, by providing a counterbalancing arcuate skirt or rim portion 26*a* which forms an effective extension of the circular perimeter of the pulsator plate 26 about the relieved region. Similarly, if circular apertures or apertures of other configuration are employed to provide the openings for admitting air to the outlet 25 rather than the semicircular plate configuration previously described, a counterweight block, rim or like structure may be mounted on the plate 26 adjacent the aperture or apertures to balance the rotating structure.

What is claimed is:

1. A traveling cleaner for travel along textile processing machines and the like to remove lint and foreign material therefrom, comprising a traveling blower housing including a rotary, motor driven blower having a discharge side for discharge of high pressure, high velocity air therefrom, a housing wall having an opening communicating with said discharge side to receive air therefrom and admit passage of the air therethrough for discharge against selected portions of the machine to dislodge lint therefrom, air pulsating means driven by the discharge air for cyclically intermittently, and alternately interrupting supply of said discharge air from said blower to said opening and readmitting said discharge air thereto at a selected repetition rate to produce a pulsating discharge of air through said opening in the form of intermittent, repetitive blasts of high pressure, high velocity air for cleaning lint from the machine parts in the path thereof, said blower housing including means defining a discharge outlet at said discharge side for discharge of said air to said opening, said air pulsating means including a pulsator plate supported for rotation about an axis spaced radially from the axis of said opening in a plane immediately above said housing wall to substantially close the opening ad admission of discharge air from said discharge outlet over a first portion of each cycle of revolution of said plate and having a relieved region registrable with said opening to admit said discharge air to said opening during a second portion of each cycle of revolution of said plate, and air driven vane means in the path of discharge air from said discharge outlet comprising a vane member connected to said plate for coordinant rotation therewith supported for movement in a circular path about the axis of rotation of said plate in intercepting relation to the discharge air stream from said discharge outlet to be driven thereby and drive said pulsator plate through its cycle of revolution, and means supporting said vane member for rotation about a radial axis perpendicular to said axis of rotation to vary the angle of attack of said vane member relative to said air stream in selected relation to the speed of rotation about said axis of rotation.

2. A traveling cleaner for travel along textile processing machine and the like to remove lint and foreign material therefrom, comprising a traveling blower housing including a rotary, motor driven blower having a discharge opening for discharge of high pressure, high velocity air therefrom, a blower trunk extending from said blower housing alongside the machine communicating with said discharge opening to receive air therefrom and having opening means for discharging air laterally inwardly against selected portions of the machine to dislodge lint therefrom, means driven by the discharge air for cyclically intermittently and alternately interrupting supply of said discharge air from said blower to said blower trunk and readmitting said discharge air thereto at a selected repetition rate to produce a pulsating discharge of air from said opening means in the form of intermittent, repetitive blasts of high pressure, high velocity air for cleaning lint from the machine parts in the path thereof, said air pulsating means including a valve member adjacent the inlet of said blower trunk for regulating admission of discharge air from said discharge outlet to said blower trunk having a first condition to substantially shut off discharge air supply to said trunk inlet and a second condition to admit discharge air supply thereto, and air driven vane means in the path of discharge air from said discharge outlet for driving said valve member alternately to said first and second conditions at a selected repetition rate, said valve member comprising a pulsator plate supported for rotation about an axis spaced radially from the axis of said blower trunk in a plane immediately above said trunk inlet to substantially close the inlet to admission of discharge air from

said discharge outlet over a first portion of each cycle of revolution of said plate and having a relieved region registrable with said inlet to admit said discharge air to said inlet during a second portion of each cycle of revolution of said plate, said air driven vane means comprising a vane member connected to said plate for coordinate rotation therewith supported for movement in a circular path about the axis of rotation of said plate in intercepting relation to the discharge air stream from said discharge outlet to be driven thereby, and means supporting said vane member for rotation about a radial axis perpendicular to said axis of rotation to vary the angle of attack of said vane member relative to said air stream in selected relation to the speed of rotation about said axis of rotation.

3. A traveling cleaner as defined in claim 1, wherein said air driven vane means comprises a bearing block supported centrally on said plate for rotation therewith, a radial rod extending through said bearing block and journaled for rotation therein about said radial axis, a vane member fixed to said rod in radially spaced relation to said bearing block for movement in a circular path about said axis of rotation responsive to the discharge air stream from said discharge outlet and thereby rotate said pulsator plate, and said rod having an extension thereon projecting in radial relation to said radial axis having weight means thereon, said extension having a length causing the free end of said extension to abut said plate when the plate is at rest and arrest downward movement of the extension at an inclination disposing the vane member at a selected maximum angle of attack to said discharge air stream to produce maximum rotative thrust, and said weight means imparting upward movement to said extension responsive to centrifugal force as the speed of rotation of the plate increases to rotate said rod about said radial axis and progressively diminish the angle of attack of the vane member to said discharge air stream.

4. A traveling cleaner for travel along a trackway positioned above and extending longitudinally of a row of textile spinning frames to remove lint and foreign material therefrom, comprising an overhead blower housing which is elongated in a direction extending transversely of said trackway substantially centered on said trackway for travel therealong and having opposite lateral end portions to overlie the opposite side of the spinning frames, said housing including a rotary, motor driven blower and means defining a discharge outlet adjacent one of said end portions communicating with said blower for discharge of high pressure, high velocity air therefrom, a blower trunk depending from said last-mentioned end portion of said blower housing alongside the spinning frames having an inlet adjacent the top thereof communicating with said discharge outlet to receive air therefrom and having a plurality of openings for discharging high pressure air streams laterally inwardly against selected portions of the spinning frames to dislodge lint therefrom, and air pulsating means for cyclically intermittently and alternately interrupting supply of said discharge air from said discharge outlet to said blower trunk and readmitting said discharge air thereto at a selected repetition rate to produce a pulsating discharge of air from said openings in the form of intermittent, repetitive blasts of high pressure, high velocity air for cleaning lint from the machine parts in the path thereof, said air pulsating means including a valve member adjacent the inlet of said blower trunk for regulating admission of discharge air from said discharge outlet to said blower trunk having a first condition to substantially shut off discharge air supply to said trunk inlet and a second condition to admit discharge air supply thereto, and air driven vane means in the path of discharge air from said discharge outlet for driving said valve member alternately to said first and second condition at a selected repetition rate, said valve member comprising a pulsator plate supported for rotation about an axis spaced radially from the axis of said blower trunk in a plane immediately above said trunk inlet to substantially close the inlet to admission of discharge air from said discharge outlet over a first portion of each cycle of revolution of said plate and having a relieved region registrable with said inlet to admit said discharge air to said inlet during a second portion of each cycle of revolution of said plate, and said air driven vane means comprising a vane member connected to said plate for coordinate rotation therewith supported for movement in a circular path about the axis of rotation of said plate in intercepting relation to the discharge air stream from said discharge outlet to be driven thereby, and means supporting said vane member for rotation about a radial axis perpendicular to said axis of rotation to vary the angle of attack of said vane member relative to said air stream in selected relation to the speed of rotation about said axis of rotation.

5. A traveling cleaner for travel along a trackway positioned above and extending longitudinally of a row of textile spinning frames to remove lint and foreign material therefrom, comprising an overhead blower housing which is elongated in a direction extending transversely of said trackway substantially centered on said trackway for travel therealong and having opposite lateral end portions to overlie the opposite side of the spinning frames, said housing including a rotary motor driven blower and means defining a discharge outlet adjacent one of said end portions communicating with said blower for discharge of high pressure, high velocity air therefrom, a blower trunk depending from said last-mentioned end portion of said blower housing alongside the spinning frames having an inlet adjacent the top thereof communicating with said discharge outlet to receive air therefrom and having a plurality of openings for discharging high pressure air streams laterally inwardly against selected portions of the spinning frames to dislodge lint therefrom, and air pulsating means for cyclically intermittently and alternately interrupting supply of said discharge air from said discharge outlet to said blower trunk and readmitting said discharge air thereto at a selected repetition rate to produce a pulsating discharge of air from said openings in the form of intermittent, repetitive blasts of high pressure, high velocity air for cleaning lint from the machine parts in the path thereof, said air pulsating means including a valve member adjacent the inlet of said blower trunk for regulating admission of discharge air from said discharge outlet to said blower trunk having a first condition to substantially shut off discharge air supply to said trunk inlet and a second condition to admit discharge air supply thereto, and air driven vane means in the path of discharge air from said discharge outlet for driving said valve member alternately to said first and second condition at a selected repetition rate, said valve member comprising a pulsator plate supported for rotation about an axis spaced radially from the axis of said blower trunk in a plane immediately above said trunk inlet to substantially close the inlet to admission of discharge air from said discharge outlet over a first portion of each cycle of revoltion of said plate and having a relieved region registrable with said inlet to admit said discharge air to said inlet during a second portion of each cycle of revolution of said plate, and said air driven vane means comprising a bearing block supported centrally on said plate for rotation therewith, a radial rod extending through said bearing block and journaled for rotation therein about said radial axis, a vane member fixed to said rod in radially spaced relation to said bearing block for movement in a circular path about said axis of rotation responsive to the discharge air stream from said discharge outlet and thereby rotate said pulsator plate, and said rod having an extension thereon projecting in radial relation to said radial axis having weight means thereon, said extension having a length causing the free end of said extension to abut

said plate when the plate is at rest and arrest downward movement of the extension at an inclination disposing the vane member at a selected maximum angle of attack to said discharge air stream to produce maximum rotatative thrust, and said weight means imparting upward movement to said extension responsive to centrifugal force as the speed of rotation of the plate increases to rotate said rod about said radial axis and progressively diminish the angle of attack of the vane member to said discharge air stream.

6. An air pulsator assembly for effecting pulsation of a supply of high pressure, high velocity air from a discharge outlet from an air blower unit to an inlet of an air conduit through which the air is to be conveyed and discharged in high pressure, high velocity discharge streams toward surfaces to be cleaned of dust and light foreign material, the pulsator assembly comprising a pulsator plate of part circular configuration having an open zone over a portion of the plate supported for rotation about an axis parallelling and spaced radially from the axis of said inlet in a plane immediately above the latter to alternately substantially close and open the inlet to admission of discharge air from said outlet during rotation thereof, and air driven vane means connected to said plate for coordinate rotation therewith disposed above said plate in intercepting relation to the path of discharge air from said outlet to be driven in a circular path about said axis of rotation by said discharge air and thereby rotate said plate, said vane means comprising a generally planiform vane member disposed in radially spaced relation to said axis of rotaion or movement in a circular path thereabout and supported for rotation about a radial axis of said axis of rotation to permit variation of the angle of attack of said vane member relative to the discharge air stream from said outlet.

7. An air pulsator assembly as defined in claim 6, wherein said air driven vane means comprises a bearing block supported centrally on said plate for rotation therewith, a radial rod extending through said bearing block and journaled for rotation therein about said radial axis, said vane member being fixed to said rod in radially spaced relation to said bearing block for movement in a circular path about said axis of rotation responsive to the discharge air stream from said discharge outlet and thereby rotate said pulsator plate, and said rod having an extension thereon projecting in radial relation to said radial axis having weight means thereon, said extension having a length causing the free end of said extension to abut said plate when the plate is at rest and arrest downward movement of the extension at an inclination disposing the vane member at a selected maximum angle of attack to said discharge air stream to produce maximum rotative thrust, and said weight means imparting upward movement to said extension responsive to centriufgal force as the speed of rotation of the plate increases to rotate said rod about said radial axis and progressively diminish the angle of attack of the vane member to said discharge air stream.

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ROBERT W. MITCHELL, Primary Examiner

U.S. Cl. X.R.

15—404