An endless abrasive belt sanding machine in which the sanding or abrading head is vertically oriented and provided with an improved dust collecting system having a suction duct connected with a source of suction and a mouth located in a closed zone partially defined by the portion of the abrasive belt leaving work performing engagement with the workpiece, and into which zone air can enter only through an air supply duct that overlies the upwardly traveling stretch of the abrasive belt and has its inlet defined by a curved hood embracing the belt tensioning roll at the top of the abrading head, and has its discharge arranged to cause the air debouching therefrom to forcibly impinge the surface of the abrasive belt directly above the mouth of the suction duct. A movable wall separates the discharge end of the air supply duct from the mouth of the suction duct and serves as a damper that can be closed to prevent entry into the suction duct of extraneous matter capable of igniting the contents of the separator and dust collecting bags to which the dust and products of abrasion are delivered when the machine is operating normally.

24 Claims, 6 Drawing Figures
This invention relates to abrading machines and refers more particularly to endless abrasive belt sanding machines of the type widely used in the woodworking industry. Such machines usually have a vertically oriented abrading head with a wide endless abrasive belt trained over a power driven contact drum at the bottom and an idler belt tensioning roll at the top, so that the belt has upwardly and downwardly traveling stretches. The contact drum holds the belt against the work passing through the machine. Needless to say, the abrasion of the work by the rapidly traveling belt generates an enormous amount of dust. Accordingly, it is an absolute necessity that sanding machines be equipped with dust collecting systems.

Conventionally, the dust collecting systems of sanding machines consist simply of a cyclone separator and two suction ducts, one leading to the separator from a suction mouth located in the machine near the zone of action and the other connecting a hood over the top of the abrading head with the separator.

While those prior dust collecting systems did succeed in removing most of the dust and products of abrasion from sanding machines, they were notoriously inefficient since they required the movement of a very high volume of air — often in excess of 4,500 cubic feet per minute to effect that removal. In addition, they necessitated a static pressure differential as high as six inches of water column at the point the suction ducts were connected to the machine. Obviously the power required to meet these needs was substantial.

The cyclone separators were usually mounted on the roof of the building in which the sanding machines were housed, or at least were so located that the air leaving the separator — and theoretically freed of dust — was discharged into the atmosphere. Since that air was not in fact free of minute dust particles, it constituted a serious source of air pollution. Government regulations no longer countenance that practice, and to meet those regulations the air debouching from the separators must now be ducted to a "bag room" where it enters huge "vacuum cleaner bags" that filter the tiny air-entrained particles from the air before it is permitted to enter the atmosphere. The power required to "push" the air through the walls of the collector bags increases as the volume of air moved rises, so that any significant reduction in that volume would result in increased efficiency.

In the search for improvement in the efficiency of dust collecting systems, it was discovered that the manner in which the air enters the zone from which the dust and products of abrasion are withdrawn has a great deal to do with the efficiency of the system. Prior dust collectors had no provision for controlling the air entering this zone. In fact, it was not known how this occurred.

With a view toward implementing the aforesaid discovery, it is an object of this invention to prevent entry of air into the zone of action where the dust and products of abrasion are generated, except through an air supply duct that not only debouches directly into the zone of action but also causes the incoming air to forcibly impinge upon the surface of the abrasive belt directly above the bottom of its upwardly traveling stretch.
Referring to the accompanying drawings, the numeral 10 designates generally the main frame of a wide belt sanding machine, in the upper portion of which there is a conventional abrading head 11 and below it a work feeding assembly 12.

The main frame — which is preferably a weldment — has a base section 14 and spaced side sections 15 and 16 rising therefrom. Rigidly fixed to the side section 16 and extending cantilever fashion therefrom towards the other side of the machine is a horizontal arm 17, which in the industry is known as a center bar. It is the center bar that carries the abrading head.

Since the abrading head is conventional, it comprises an endless abrasive belt 18 trained over a contact drum 19 at the bottom of the head and an idler roll 20 at the top. As shown and described in the Bernu Pat. No. 3,777,442, which is issued to the assignee of the present invention, the contact drum 19 is journaled in bearings that are fixed to and project down from the center bar, and the idler roll 20 is journaled in bearings 21 on the arms of a yoke 22 that is supported above the center bar by the ram 23 of an air cylinder mounted on the center bar. In this manner, the idler roll 20 can be raised to tension the abrasive belt and lowered to enable the same to be removed and replaced when necessary.

The contact drum 19 at the bottom of the abrading head is drivenly connected with a motor (not shown) and imparts high speed orbital motion to the abrasive belt in the counterclockwise direction, as viewed in FIGS. 2 and 3. The belt thus has upwardly and downwardly traveling stretches indicated by the arrows U and D in FIG. 2.

It is the contact drum that holds the abrasive belt against the surface of the workpieces as they are carried through the machine by an endless power driven conveyor belt 24 which forms part of the work feeding assembly 12. By virtue of the counterclockwise rotation of the contact drum, the dust and products of abrasion that result from the work performing engagement between the abrasive belt and the workpieces, are thrown upstream with respect to the direction the workpieces move through the machine and upwardly along the upwardly traveling stretch of the abrasive belt.

As is customary, the elevation of work feeding assembly 12 is adjustable to accommodate different thicknesses of work. The mechanism by which that adjustment is made comprises a plurality of jack screws on which the assembly 12 is supported and which are simultaneously actuated by rotation of a handwheel 25. With the elevation of the work feeding assembly properly set, the workpieces — one of which is shown in FIG. 2 — are gripped between superimposed top and bottom pinch rolls 26 and 27 respectively, the former being mounted in the main frame of the machine at the infeed and outfeed sides of the abrading head and the latter being part of the work feeding assembly. As is customary, the upper pinch rolls are yieldingly biased downwardly to press the work against the work feeding conveyor belt.

There are also infeed and outfeed pressure shoes 28 and 29, respectively, to hold the work down as close as possible to the “line” of contact between the abrasive belt and the workpiece as the latter first comes into contact with the belt and as it leaves the same. These shoes are mounted between side plates that are a fixed part of the machine frame, and extend across the entire width of the abrasive belt. Like the top pinch rolls, the work engaging toe portions of the shoes are yieldingly pressed against the work.

From the standpoint of this invention, it is important to note that the infeed shoe 28 has a concave curved surface relatively close to the adjacent portion of the abrasive belt. While that relationship is not new, its existence is utilized in achieving one of the objectives of the invention, as will appear as the description proceeds.

As in prior dust collecting systems of wide belt sanding machines, the dust and products of abrasion generated by the machine in operation are drawn from the zone of action through a suction duct 30 that has its mouth 31 closely adjacent to the bottom of the abrading head, and its discharge end connected by a pipe 32 with a cyclone separator (not shown). The separator provides a source of suction to draw the dust and products of abrasion into the mouth 31 of the suction duct, as it did in all prior dust collecting systems. But, contrary to prior dust collectors which had no provision for controlling admission of make-up air to the zone from which the mouth of the suction duct drew the air, entrained dust and products of abrasion — the present invention not only controls the admission of make-up air to that zone but, in addition, utilizes its entry to sweep dust and products of abrasion off of the abrasive belt.

To this end, the make-up air is fed to the zone of action through an upright air supply duct 33 that overlies and is coextensive in size and shape with the upwardly traveling stretch of the abrasive belt. The inlet to this air supply duct is defined by a curved hood 33' that embraces the belt tensioning roll 20 at the top of the abrading head, and its outlet is directly above the mouth 31 of the suction duct.

The air supply duct 33 has flat front and rear walls 34 and 35, respectively, connected by narrow, parallel side walls 36, and as best seen in FIGS. 4 and 5 the two ducts are joined together into a unitary structure with the rear wall 35 of the air supply duct forming the front wall of the suction duct. Since the pipe 32 that leads to the cyclone separator is round, the side walls 37 of the suction duct converge toward the top of the duct and its rear wall 38 diverges from the wall 35 so that the cross sectional area of the suction duct remains substantially uniform from top to bottom. A transition section 39 at the top of the suction duct gradually changes its cross sectional shape from rectangular to round to make possible its connection to the pipe 32.

The unitary duct structure comprising the joined air supply and suction ducts is suitably mounted in the machine with the front wall 34 of the air supply duct closely adjacent to and parallel with the upwardly traveling stretch of the abrasive belt and the transition section 39 of the suction duct protruding from the top of the machine. This places the top of the air supply duct at a level near that of the axis of the belt tensioning roll 20 when the abrasive belt is of average length, but since belt length varies, the elevation of the roll 20 will change accordingly. Therefore, in order for the curved hood 33' — which defines the inlet to the air supply duct — to occupy a predetermined position with respect to the top of the abrading head, it is hingedly connected, as at 40, to the back wall 35 of the air supply duct and rests on castors mounted in brackets 41 that
are fixed to the bearings 21 in which the roll 20 is journaled. In this way, the bottom wall 42 of the curved hood will always be spaced the same distance above the top of the abrading head, despite variations in the elevation of the roll 20; and to assure continuity between the hood and the air supply duct, the discharge end of the former extends a short distance into the top of the air supply duct.

Attention is directed to the location of the front edge 43 of the bottom wall of the curved hood. It is spaced back from the front edges of the side and top walls of the hood and lies between the crest of the top of the abrading head and the start of the downwardly traveling stretch of the abrasive belt. Hence dust and products of abrasion that are thrown from the belt by centrifugal force as the belt travels over the roll 20, can enter the inlet of the hood.

To assist in directing such dust and products of abrasion into the hood, a deflector unit 44 is secured at its ends to the side walls of the hood and spans the distance therebetween ahead of the front edge 43 of the hood bottom wall.

All of the dust that in prior dust collecting systems was drawn from the region above the top of the abrading head by a separate dust hood connected with a source of suction, by this invention is carried from that region by the air stream entering the air supply duct through the curved hood.

Since the mouth of the suction duct is located in the zone where the dust and products of abrasion are generated, most of it by far is drawn into the suction duct, but that which is not will be carried along by the upwardly traveling stretch of the abrasive belt. By virtue of its location closely adjacent to this stretch of the belt, the air supply duct coacts with the belt to confine the rising dust particles to a path that leads to the region above the abrading head from which the make-up air is drawn. For all practical purposes, therefore, all of the dust and products of abrasion that are generated during the operation of the machine are carried into the suction duct by the same air stream.

One of the most important aspects of the invention and to a large degree the reason why it has so significantly increased the efficiency of the dust collector, resides in the fact that the zone from which the mouth of the suction duct draws the air and the air-entrained dust and products of abrasion, is substantially closed against entry of air thereto, except through the air supply duct 33. To this end, the side wall 36 of the air supply duct at the far side of the machine in FIGS. 2 and 3, has an extension 45 with a convexly curved bottom edge 46 that lies closely adjacent to the concavely curved top surface of the infeed shoe 28. At the near side of the machine, there is a similar downward extension 47 of the adjacent side wall of the air supply duct, but this extension is hingedly mounted, as at 47, to enable the same to be lifted when access to the suction zone is necessary.

The infeed shoe 28 and the downward extensions 45 and 47 of the side walls of the air supply duct thus coact with one another and with the adjacent abrasive belt to restrict unwanted entry of air into the suction zone, and to further guard against such unwanted entry of air into the suction zone, the side walls and back wall of the suction duct project downwardly far enough to coact with the extensions 46 and 47 and with the infeed shoe.

Another factor in the control of air admission to the suction zone is the close proximity of the front edges 48 of the extensions 45 and 47 to the upwardly traveling stretch of the abrasive belt. To minimize the hazard of fire resulting from sparking, these front edges of the extensions are covered with shields 49 of non-sparking material, such as aluminum. For the same reason the front wall 34 of the air supply duct 33 is covered with an aluminum shield 49.

Just above its outlet, the air supply duct is reduced in cross section to increase the velocity of the discharging make-up air. This reduction or constriction results essentially from the securement of a shallow V-shaped wall section 50 to the inside surface of the front wall 34 of the air supply duct. This V-shaped wall section extends from side wall to side wall of the air supply duct and has its downstream flange 51 extended beyond the bottom edge of the front wall 34 to define the upper edge of the narrow elongated outlet of the air supply duct. As in the case of the front edges of the downward extensions 45 and 47, the underside of the flange 51 has a shield 51 of nonsparking metal applied to it. The foremost edge of this shield which extends across the full width of the abrasive belt, is closely adjacent to the belt, the spacing therebetween being on the order of one-eighth of an inch. Accordingly, dust and products of abrasion are stripped off of the upwardly traveling stretch of the belt by the shield 51.

The bottom edge of the narrow elongated outlet of the air supply duct is formed by a rectangular wall or plate 52 that is hingedly connected to a pair of brackets 53 suitably fixed to the frame of the machine in embracing relation with the air supply and suction ducts. These brackets also form part of the structure by which the air supply and suction duct assembly is mounted.

Specifically, the hinged mounting of the plate 52 comprises a rod 54 that is welded to one edge of the plate and has its end portions journaled in holes in the brackets 53. The plate 52 spans the distance between the side walls 36 of the air supply duct, so that by virtue of its hinged mounting the plate forms a damper common to both the outlet of the air supply duct and the mouth of the suction duct. In fact, this damper separates the two ducts from one another at the point of their communication.

Being located inwardly of the rear wall 35 of the air supply duct and opposite the V-shaped wall section 50, the rod 54 coacts with the apex of the V-shaped wall section to form the constriction by which the velocity of the air discharging from the air supply duct is increased. To smoothly guide the air flow past the rod 54, the bottom edge portion of the rear wall 35 is bent forwardly and then upwardly at an angle to form a sloping wall section 55 that lies opposite the upper flange of the V-shaped wall section 50, and is in downward convergent relation therewith. A thin resiliently flexible metal strip 56 fixed to the sloping wall section 55 and projecting downwardly therefrom, assures against loss of make-up air through the inevitable clearance between the rod 54 and the bottom of the rear wall 35.

A lever 57 fixed to one end of the rod 54 and connected with the piston of an air cylinder 58 by a link 59 provides power means for swinging the damper 52 between its normal or open position shown in full lines in FIG. 3 and a closed position indicated in dotted lines. In the latter of these positions, the damper essentially closes the mouth of the suction duct to prevent entry.
into that duct of extraneous matter that could cause highly dangerous consequences. This is therefore a very advantageous and valuable feature of the invention, since it greatly minimizes the fire hazard by excluding from the suction duct hot fragments of a broken belt that could ignite the dust in a flash.

While activation of the valves that govern connection of the air cylinder with a source of air pressure can be left entirely to manual control, it is preferable to employ for that purpose an automatic control that is responsive to strategically located sensing means which detect the occurrence of accidents such as breakage of the abrasive belt, and even manual shut-down of the machine. Since such controls can be of any conventional type, they have not been illustrated, but merely indicated by the box AC in FIG. 2.

In its normal open position, the damper 52 is parallel to the lower flange 51 of the V-shaped wall section 50 and coacts therewith to direct the high velocity air debouching from the air supply duct against the area of the upwardly traveling stretch of the abrasive belt that lies just above the line of tangency between the belt and the contact drum. The angle at which the air forcibly impinges upon the abrasive belt has been found to be critical. It should be between 38° and 45°, as indicated in FIG. 3.

With the damper in its normal open position, its free edge is close to the abrasive belt and coacts therewith to define a restricted throat through which the air must pass to reach the mouth of the suction duct and, in doing so, the air exerts a powerful wiping action on the belt surface. To minimize turbulence in the air as it passes around the free edge of the damper, that edge has a smooth surfaced shield 60 applied thereto and, for protection against sparking, this shield is formed of aluminum. The medial portion of the shield which embraces the edge of the damper is convexly curved to eliminate abrupt changes in direction of the air flow.

As is customary in sanding machines, the abrasive head is enclosed in a cabinet-like housing 61 having upright walls fixed to the frame of the machine and a hinged door 62 which, when open, affords access not only to the abrasive head for removal and replacement of sanding belts, but also to the dust collector and its appurtenances. Air enters the housing 61 through an inlet hood 63 on its top wall.

In the preferred embodiment of the invention, the air supply and suction ducts — connected as they are into a unitary structure — are fixedly mounted which makes the placement and removal of abrasive belts slightly difficult. To remove that objection, the duct structure can be mounted to swing from its operative position to a retracted position spaced farther away from the abrasive head, as in FIG. 6. For this purpose, the duct structure is carried by upper and lower paired arms 65 and 66, respectively, that are pivoted to brackets fixed to the frame of the machine. An air cylinder 67 suitably mounted at each side of the machine with its piston connected to the adjacent lower arm 66 through a link 68, provides power means to shift the duct structure from one position to the other.

The increase in the efficiency of dust collecting systems which this invention has achieved, is evidenced by the fact that it requires only 1500 cubic feet of air per minute (1,500 CFM) to remove all of the dust and products of abrasion in a sanding machine that, with prior dust collectors, required 4500 cubic feet of air per minute (4,500 CFM) to do the same job.

Other evidence of the improvement accomplished by this invention is the reduction in the static pressure differential needed to move the air, from 6 to 4 inches of water column.

The saving in power requirements are therefore quite substantial and, since this invention also has eliminated the heretofore required dust collecting hood above the abrading head, there is also a significant reduction in the cost of the dust collecting system.

Those skilled in the art will appreciate that the invention can be embodied in forms other than as herein disclosed for purposes of illustration.

The invention is defined by the following claims:

I claim:
1. In an abrading machine having a substantially vertically oriented abrading head that has a power driven endless abrasive belt with upwardly and downwardly traveling stretches, held against work fed through the machine by a backup member located at the bottom of the abrading head, improved dust collecting means for removing the dust and products of abrasion incident to operation of the machine, and which comprises the combination of:
   A. a vertically oriented air supply duct adjacent to the upwardly traveling stretch of the abrasive belt, the inlet to said air supply duct being at its top and the outlet at its bottom;
   B. means at the outlet of the air supply duct to cause the air issuing therefrom to impinge upon the abrasive belt in a zone located a short distance above the bottom of the upwardly traveling stretch of the belt;
   C. a suction duct connectable with a source of suction and having its mouth contiguous to the outlet of the air supply duct to draw air, dust and the products of abrasion from said zone; and
   D. closure means coacting with the abrasive belt to restrict access to said zone and thereby minimize the possibility of air entering said zone except through the air supply duct.
2. In an abrading machine, the invention defined by claim 1, wherein the outlet of the air supply duct is a narrow slot with parallel upstream and downstream edges that extend across the width of the abrasive belt, the upstream edge being spaced from but sufficiently close to the upwardly traveling stretch of the abrasive belt to enable said edge to effect removal of dust and products of abrasion carried along by the belt and to cause the same to be entrained by the air issuing from the outlet of the air supply duct; and wherein the mouth of said suction duct is directly below the outlet of the air supply duct and extends across the width of the abrasive belt and communicates with said zone through the space between the mouth of the suction duct and the abrasive belt.
3. In an abrading machine, the invention defined by claim 2, wherein the downstream edge of the outlet of the air supply duct coacts with the abrasive belt to define the size of the space communicating said zone with the mouth of the suction duct.
4. In an abrading machine, the invention defined by claim 3, wherein the means at the outlet of the air supply duct that causes the air issuing therefrom to impinge upon the abrasive belt is a substantially rectangular wall with opposite top and bottom edges and oppo-
3,872,627

5. In an abrading machine, the invention defined by claim 4, wherein the bottom edge of said substantially rectangular wall is defined by a smooth convexly curved surface.

6. In an abrading machine, the invention defined by claim 4, wherein the size of the mouth of the suction duct is determined by the distance the bottom edge of said substantially rectangular wall is from the abrasive belt; and further characterized by hinge means at an elevation above that of the upstream edge of the outlet of the air supply duct connected with the top edge of said substantially rectangular wall to mount said wall for swinging motion between a wide open position in which its bottom edge is close to the abrasive belt and the mouth of the suction duct is of maximum size and a closed position in which said bottom edge is remote from the abrasive belt and the mouth of the suction duct is essentially closed.

7. In an abrading machine having an abrading head with a power driven endless abrasive belt and a backup member engaging the back of the belt to hold the same against the surface of a workpiece being abraded, and also having a suction duct to carry off dust and products of abrasion incident to operation of the machine, said machine being characterized by:

A. means mounting said suction duct with its mouth closely adjacent to the backup member and hence at the source of the dust and products of abrasion;
B. an air supply duct having its inlet remote from the back-up member and its outlet adjacent to the inlet of the suction duct;
C. a door at the mouth of the suction duct that is movable between a first position directing the air issuing from the outlet of the air supply duct against the adjacent surface of the abrasive belt and a second position essentially closing the mouth of the suction duct to prevent entry into the suction duct of extraneous matter capable of causing serious consequences if permitted to enter the suction duct; and
D. means for moving said door from one to the other of said positions.

8. The abrading machine of claim 7, wherein the means for moving said door is manually operable.

9. The abrading machine of claim 7, wherein the means for moving said door to its second position is controlled by sensing means responsive to the occurrence of any one of a number of events, such as breakage of the abrasive belt or any other malfunctioning of the abrading head, and manual shut-down of the machine,

and wherein the detection of such an event by the sensing means automatically effects movement of the door to its second position.

10. In an abrading machine having a vertically oriented abrading head with a power driven endless abrasive belt trained over a belt tensioning roll at the top of the head and held against the work being abraded by a backup member at the bottom of the head, so that the belt has upwardly and downwardly traveling stretches, improved dust collecting means for removing the dust and products of abrasion incident to operation of the machine, comprising:

A. a suction duct connectable with a source of suction and having a mouth in juxtaposition to the backup member to suck the air-entrained dust and products of abrasion from the zone in which they are produced;
B. an air supply duct having its inlet adjacent to the belt tensioning roll and its outlet directly above the mouth of the suction duct and facing the upwardly traveling stretch of the abrasive belt;
C. a movable door adjacent to the outlet of the air supply duct and the mouth of the suction duct operable in one position thereof to direct the air issuing from the outlet of the air supply duct against the adjacent surface of the abrasive belt and in another position to close said mouth and thereby prevent entry into the suction duct of extraneous matter capable of causing objectionable consequences if permitted to enter the suction duct; and
D. means for moving said door from one to the other of said positions.

11. The abrading machine of claim 10, wherein said movable door has a hingedly mounted edge and a free edge, the latter coacting with the abrasive belt to define a constricted throat that communicates the air supply duct with the suction duct.

12. The abrading machine of claim 10, further characterized by:

means including said movable door to cause the air debouching from the air supply duct to forcibly impinge upon the upwardly traveling stretch of the abrasive belt.

13. In an abrading machine having a vertically oriented abrading head with a power driven endless abrasive belt trained over a belt tensioning roll at the top of the head and held against the work being abraded by a backup member at the bottom of the head, so that the belt has upwardly and downwardly traveling stretches, improved dust collecting means for removing the dust and products of abrasion incident to operation of the machine, comprising:

A. a suction duct connectable with a source of suction and having a mouth in juxtaposition to the backup member to suck the air-entrained dust and products of abrasion from the zone in which they are produced;
B. an air supply duct through which air is brought to said zone, said air supply duct having an outlet directly above the mouth of the suction duct; and
C. air directing means at the outlet of the air supply duct to cause the air entering said zone to impinge upon the upwardly traveling stretch of the abrasive belt as the belt leaves the backup member at an angle of between 38° and 45° to the upwardly traveling stretch of the belt.

14. The abrading machine in claim 13, wherein the backup member is a contact drum, and wherein the air directing means causes the air to impinge upon the abrasive belt directly above the line of tangency between the upwardly traveling stretch of the belt and the contact drum.

15. In an abrading machine having a vertically oriented abrading head with a power driven endless abrasive belt trained over a belt tensioning roll at the top of the head and held against the work being abraded by a backup member at the bottom of the head, so that the belt has upwardly and downwardly traveling stretches, improved dust collecting means for removing the dust
and products of abrasion incident to operation of the machine, comprising:

A. an air supply duct having inlet and outlet ends, and opposite inner and outer walls, at least the former of said walls being substantially coextensive in size and shape with the upwardly traveling stretch of the abrasive belt;

B. a curved air inlet duct having an entrance and an exit;

C. a suction duct having an outlet connectable with a source of suction and a mouth through which air entrained dust and products of abrasion are drawn into the suction duct when the machine is in operation;

D. means joining said ducts into a unitary structure with the exit of the curved air inlet duct opening into the inlet end of the air supply duct and with the suction duct overlying said outer wall of the air supply duct and its mouth contiguous to the outlet end of the air supply duct; and

E. means mounting said unitary structure in an operative position adjacent to the abrading head, in which position said inner wall of the air supply duct overlies and is closely adjacent to the upwardly traveling stretch of the abrasive belt, the curved air inlet duct embraces the belt tensioning roll and the entrance thereof is positioned to receive air from the space surrounding the belt tensioning roll and also receive air-entrained dust and products of abrasion leaving the passing abrasive belt, and the outlet end of the air supply duct and the mouth of the suction duct are contiguous to the backup member at the bottom of the abrading head, so that the same air moving through the ducts carries away dust and products of abrasion from both the zone of action where the abrasion takes place and from the zone at the top of the abrading head.

16. The abrading machine of claim 15, wherein said means mounting said unitary structure provides for bodily movement thereof from its defined operative position to a retracted position to facilitate access to the abrading head,

and further characterized by means for effecting such bodily movement of said unitary structure from and back to its defined operative position.

17. An abrading machine having an abrading head with a power driven endless abrasive belt trained over a belt tensioning roll and held against the work being abraded by a backup member engaging the back of the belt, improved dust collecting means for carrying off dust and products of abrasion incident to operation of the machine, said dust collecting means comprising:

A. an air supply duct overlying a stretch of the abrasive belt and having its inlet adjacent to the belt tensioning roll and its outlet opening to a zone adjacent to the backup member;

B. a suction duct connectable with a source of suction and having its mouth contiguous to the outlet of the air supply duct to draw air, dust and products of abrasion from said zone; and

C. closure means coacting with the abrasive belt to restrict access to said zone and thereby minimize the possibility of air entering said zone except through the air supply duct.

18. The invention defined in claim 17, further characterized by:

structure connected with the inlet of the air supply duct arranged to direct dust and products of abrasion that reach the zone in which the belt tensioning roll is located into the air stream entering the inlet of the air supply duct.

19. The invention defined in claim 18, wherein the abrading head is vertically oriented with its belt tensioning roll at the top and its backup member at the bottom, so that the abrasive belt has upwardly and downwardly traveling stretches, and wherein the air supply duct has opposite walls, one of which is uniformly closely spaced from and substantially coextensive in size and shape with the upwardly traveling stretch of the abrasive belt, so that the air supply duct coacts with the upwardly traveling stretch of the abrasive belt to form a passage through which dust and products of abrasion that are carried along by the upwardly traveling stretch of the belt reach the zone in which the belt tensioning roll is located.

20. The invention defined in claim 18, wherein the abrading head is vertically oriented with its belt tensioning roll at the top and its backup member at the bottom, so that the abrasive belt has upwardly and downwardly traveling stretches, wherein the air supply duct is upright and overlies the upwardly traveling stretch of the abrasive belt, wherein the inlet of the air supply duct is at a fixed level near the line of tangency between the upwardly traveling stretch of the abrasive belt and the belt tensioning roll, said inlet having a narrow oblong shape, the long margins of which are generally parallel to the axis of the belt tensioning roll and extend for substantially the width of the abrasive belt, one of said long margins being farther from the belt than the other, and wherein said structure connected with the inlet of the air supply duct comprises a hood embracing the top of the belt tensioning roll, said hood having an inlet and an outlet and being defined in part by a top wall which is joined to said long margin that is farthest from the belt.

21. The abrading machine of claim 20, wherein the hood has top and bottom curved walls connected by opposite side walls to form a curved extension of the upright air supply duct, the hood having an inlet remote from its connection with said upright air supply duct, and the bottom curved wall of the hood being relatively close to the cylindrical surface of the belt tensioning roll.

22. The abrading machine of claim 21, wherein the hood has a hinged connection with the top of said upright duct, the axis of that hinged connection being substantially parallel to the axis of the belt tensioning roll, and the hood being free to rock about the axis of its hinged connection with the upright duct, and further characterized by support means at the top of the abrading head and fixed with respect to the axis of the belt tensioning roll, and means on the hood seated upon said support means to positionally orient the hood with respect to the belt tensioning roll despite variations in the elevation thereof.

23. The abrading machine of claim 21, further characterized by
13. Deflector means at the inlet to the hood in close juxtaposition to the adjacent surface of the abrasive belt, to intercept dust and products of abrasion traveling with the belt and direct the same into the hood.

24. The abrading machine of claim 22, further characterized by deflector means at the inlet to the hood in close juxtaposition to the adjacent surface of the abrasive belt, to intercept dust and products of abrasion traveling with the belt and direct the same into the hood.

* * * * *