VENTILATING SYSTEM FOR TRAVELING CRANE CABS, EXHAUST HOODS AND THE LIKE

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ABSTRACT
A ventilating system for travelling fume hoods and cabs of travelling vehicles such as cranes wherein an air supply or exhaust unit is located outside the area in which the hood or vehicle operates. The air supply or exhaust unit blows air to or exhausts gases through a duct having an elongated slot therein. In the case of the travelling vehicle an air scoop, receiving air from the slot and delivering it to the crane cab, travels back and forth in the slot as the crane travels and a special sealing device keeps the slot sealed in front of and behind the air scoop. The procedure is reversed when gases are being exhausted from a travelling fume hood or other travelling exhaust system.

14 Claims, 17 Drawing Figures
VENTILATING SYSTEM FOR TRAVELING CRANE CABS, EXHAUST HOODS AND THE LIKE
This application is a continuation-in-part of application Ser. No. 318,007, filed Dec. 26, 1972, now abandoned.
The present invention relates to a ventilating system for moving or travelling gas filled vehicles such as travelling cranes or exhaust hoods and more particularly to a system for supplying clean air to the cab of a moving vehicle which is operating in a hot and/or dirty and/or noxious gas-laden atmosphere or to a system for exhausting noxious gases from travelling exhaust hoods and the like.

As is well known, moving vehicles such as overhead cranes and scale cars are utilized in industrial plants such as smelting and refining plants, steel plants, cement works, chemical plants, and melting, casting and metal working shops to transport heavy loads, e.g. molten metal or slag, hot metal ingots or billets, chemicals, metal products and feed stock for furnaces, from one work area to another. The spaces through which these vehicles move and in which the operators' cabs are located are usually very hot and/or highly polluted by gaseous and finely divided solid contaminants. Cooling systems for the cabs of such vehicles have either not been used at all or have been located directly on the moving vehicle and have not been successful in filtering out solid and gaseous contaminants. Furthermore, such vehicle-located units become quickly fouled and even plugged up with dirt and corrosion products caused by condensed liquid contaminants and are subject to continuous vibration and excessive operating temperatures. Shut-down and maintenance of such cooling units is an all too frequent occurrence.

A number of devices have been used in the prior art for controlling and eliminating noxious gases in fume hoods located over chemical testing and analysis areas or over areas involved in the cleaning and grinding of metals. Thus, in U.S. Pat. Nos. 2,923,227, 3,176,971, 3,377,940 and 3,443,802, various types of fume hoods are disclosed which can be moved to different parts of a work area. However, in none of these patents is a system disclosed which can be used either for supplying an enclosed travelling work area situated in a remote location, as with the cab of a travelling crane, or for the exhausting of noxious gases from a work area which is moving from place to place.

A ventilating system is now provided by the present invention which supplies air from outside the work area to the cab of a travelling vehicle such as an overhead crane while locating the supply unit mechanism remote and separate from the crane itself, thereby eliminating gaseous and solid contaminants from the cab which are polluting the atmosphere of the work area in which the cab is located. The system can also be used on a reverse principle for exhausting noxious gases from travelling fume or exhaust hoods.

It is an object of the present invention to provide clean air to the cab of a travelling vehicle while avoiding the placement of any ventilating or air conditioning mechanism on the vehicle itself.

It is a further object of the invention to provide a means for efficiently carrying away noxious fumes from travelling exhaust hoods without substantial escape of fumes.

Other objects and advantages of the invention will be apparent from the following description taken in conjunction with the accompanying drawings in which;

FIG. 1 is a diagrammatic representation in perspective of a clean air supply system embodying the present invention;
FIG. 2 is an elevational view of a portion of the system shown in FIG. 1;
FIG. 3 is an enlarged perspective view, partly in section and partly broken away, showing the supply air duct and cab air pick-up scoop in the arrangement shown in FIG. 2;
FIG. 4 is a sectional view, partly broken away, through line 4—4 of FIG. 3;
FIG. 5 is a perspective view in diagrammatic form of a further embodiment of the invention;
FIG. 6 is an elevational view, partially broken away of an exhaust system embodying the invention;
FIG. 7 is a perspective view of a portion of the apparatus shown in FIG. 6; and
FIG. 8 is a perspective view of a joint used between the two sections of one of the flexible flaps used in the sealing member of the invention;
FIG. 9 is a top plan view of a sealing member showing the placement of joints between the flexible flaps;
FIG. 10 is a perspective view of a variation of a gas delivery scoop riding in a sealing member, further embodying the invention;
FIG. 11 is a partial sectional view taken through line 11—11 of FIG. 10;
FIG. 12 is a partial sectional view taken through line 12—12 of FIG. 10;
FIG. 13 is a perspective view of a further variation embodying the gas delivery scoop and sealing member of the invention;
FIG. 14 is an elevational view in section of the system shown in FIG. 13 illustrating pivotal motion in the gas delivery scoop;
FIG. 15 is a perspective view of a scale car utilizing a system embodying the invention;
FIG. 16 is a perspective view, partially broken away of an exit and re-entry system for the gas delivery scoop of the invention; and
FIG. 17 is a perspective view of a still further embodiment of the invention used on a travelling crane.

Generally speaking, the present invention relates to a ventilating system for a travelling gas-filled vehicle, such as the cab of a travelling crane or a travelling exhaust hood, in which clean air is supplied from an air supply unit, such as an air conditioning unit which is drawing air from outside the work area in which the vehicle is located and preferably from outside the actual building in which the vehicle is operating. Alternatively, an exhausting device draws noxious fumes from a travelling exhaust hood. An elongated gas duct is located along the path of travel of the vehicle such as near and parallel to one of the tracks on which the vehicle travels. A clean air supply line, or exhaust line depending on the application, is connected to the gas duct and this line is connected to an air supply unit, e.g. a high pressure air conditioning unit, or to an exhausting device. An elongated slot is located along the length of the gas duct, the slot having spaced apart opposed edges in said gas duct. A continuous sealing member is located in and along the full length of said slot which normally seals it against outward or inward flow of gases therethrough. The sealing member comprises two
3,913,470

flexible flaps of elastomeric material, one flap being attached to the other edge of the slot, and the flaps are biased to bear against each other and provide an air-seal for the slot. The sealing member is so designed that the flaps are held in sealing engagement against each other by positive or negative pressure as the case may be in the gas duct. Each flap has a sealing portion curled inwardly and substantially back on itself and with an open end, the open being unattached and allowing a rolling action in the flap. Furthermore, the flaps are advantageously located to provide protection for the sealing member against hot gases or metal or slag and/or dirt. A gas delivery scoop is connected to the vehicle and the scoop has one end opening in the gas duct and the other end opening into the vehicle. The end of the scoop opening into the gas duct is slidably inserted in the elongated slot between the flexible flaps and is of flattened oblong configuration on a cross section thereof with acutely radiusd edges located in the slot to provide an opening and closing of the slot with minimum air leakage therefrom.

When the system is operating as an exhaust system such as for exhausting noxious fumes from a travelling vehicle, such as coke ovens from which noxious gases are periodically discharged, the gas line connected to the elongated duct is an exhaust line and is connected in turn to an exhausting device, such as an exhaust fan. The gas delivery scoop in such a case is an exhaust scoop and each flexible flap on the sealing member has an outer sealing portion located outside the elongated duct.

When the travelling gas-filled vehicle is the cab of a travelling vehicle such as a crane, the gas duct and gas line are an air duct and an air supply line respectively, and a source of clean air is connected to the air supply line, the system operating, for example as an air conditioning system, although warmed clean air may be supplied, if desired. The gas delivery scoop is an air pick up scoop and the air scoop opens into the air duct and the crane cab. Each flexible flap has an inner sealing portion located inside the air duct.

Referring now to the drawings, and in particular to FIGS. 1 and 2, a travelling crane 10, of the type used in industrial plants, e.g. smelting and refining plants or in melting and casting shops, travelling on fixed rails 11, 12 is shown. The crane 10 has a cab 13, a movable hoisting trolley 14 and a large heavy duty operating motor 15. An operator is, of course, located in the cab 13 and he operates the crane 10, which is used for lifting and transferring heavy loads, usually in a very hot and heavily polluted atmosphere. The cab 13 is seen to be completely enclosed and protected from the surrounding atmosphere.

A stationary elongated air duct 16 is located along one side of the path of travel of the crane 10, advantageously close to and below rail 11, which is shown mounted on a supporting wall 17. The air duct 16 is seen to be located along the full path of travel of the crane 10 and is supported by suitable means such as by brackets 18 (one only being shown in FIG. 2). A clean air supply line 19 is attached to and opens into one end of the air duct 16 advantageously by way of flexible connection 40, and a source of clean air, such as air conditioning supply unit 20 provides a flow of conditioned air to and through the supply line 19 and into the air duct 16. It is to be noted that the air conditioning supply unit 20 is located outside of building 21 in which the crane 10 is operating, thereby avoiding having to utilize contaminated air from inside the building. A static pressure controller 44 controls pressure of air being delivered through the supply line 19 to the air duct 16.

An elongated slot 22 is formed in the air duct 16, along substantially the full length thereof and the slot 22 has spaced apart opposing edges 23 in the air duct 16. A continuous sealing member is integrally attached to the air duct 16 in and along the full length of the slot 22, normally sealing the slot against outward flow of air therethrough. The sealing member is made up of two flexible flaps 24 of elastomeric material, one flap being attached to one and the second flap being attached to the other of the opposed edges 23, as clearly shown in FIGS. 3 and 4. The flaps 24 are biased to bear firmly against each other and are held in sealing engagement along the length thereof by positive air pressure inside the duct 16, thereby providing a seal for the slot 22 and substantially preventing escape of air therethrough.

A gas delivery scoop, in this embodiment an air pick-up scoop 25, has one end 26 opening into constant volume controller 41 by way of flexible connecting hose 27 and the other end 29 opening in and discharging air from the air duct 16. The scoop 25 and the controller 41 are attached to the cab 13 of the crane 10, such as by way of brackets 43. The end 29 of the pick-up scoop 25 opening in the air duct 16 is slidably inserted in the slot 22 between the flexible flaps 24 and is of flattened oblong configuration as shown in FIG. 3 with acutely radiusd edges 30 riding in the slot 22. As shown in FIGS. 3 and 4 each of the flexible flaps 24 has an inner sealing portion 27 curled inwardly and back on itself, substantially in a circle, and with an open end 28. The open ends 28 allow for a rolling action in the flaps 24 as the scoop 25 passes back and forth through the slot 22. Flattened end 29 of the air pick-up scoop 25 advantageously has a cross section somewhat like an airfoil, as shown in FIG. 3, to provide the most effective passage back and forth through the slot 22 while allowing an effective seal between the flexible flaps 24 in front of and behind the end 29 of the scoop 25.

The constant volume controller 41 to which the air scoop 25 is attached by way of the connecting hose 42 maintains a constant air volume to the crane cab 13. The controller 41 is used to overcome the extreme variations of static pressure in the air duct 16 due to the constantly changing distance between the crane cab and the air conditioning supply unit 20. In the embodiment shown in FIG. 2 the conditioned air from the controller 41 is delivered to the cab 13 by way of supply duct 45 which is preferably insulated and terminates in a distributing plenum 46 on the cab 13. Air outlet devices are located on the plenum 46 in the cab, such as louvres 47 and adjustable Punka louvre 48.

The fresh, cooled air being blown into the cab 13 is exhausted through a suitable exhaust outlet such as outlet 31 shown in FIGS. 1 and 2, and, advantageously, this clean exhaust air is taken through an exhaust fan 32 located on the crane 10, with fan inlet 33 connected to the cab outlet 31 and fan outlet 34 located to blow air on and through the operating motor 15 of the crane. In this way, the motor 15 is kept supplied with clean air and fouling and plugging up of the motor in the polluted atmosphere is greatly lessened. It is to be noted that cab air may be exhausted for additional purposes. Thus the exhausted cab air may be harnessed to pre-
suriize various electrical components (not shown), such as switching devices, located in the vicinity of the cab. The positive pressure would thus prevent ingestion of dirt into the components and incidences of malfunction are thus lessened. Furthermore, the exhausted air may be diverted on other mechanical devices located on the crane, such as hoist brakes, thus enhancing their operation in a polluted environment. The exhausted air may also be harnessed to provide a source of clean, fresh air to a walkway (not shown), located on the crane, which permits repair access to crane and cab operating parts. Thus, the exhausted air is caused to flow into a duct extending along the length of the walkway. Repairmen, located on the walkway, may have resort to a stream of clean, fresh air emitted through louvers or similar exhausting vents located at positions along the duct.

The operation of the air conditioning system for the travelling crane cab embodying the invention can be readily ascertained from the foregoing description taken in conjunction with the drawings. Clean, fresh air is drawn from outside the building in which the crane is housed and is advantageously cleaned and cooled in an air conditioning unit or heated, if desired. The conditioned air is continuously supplied to the longitudinal air duct in the system and, as the crane moves back and forth in the building, the sliding air pick-up scoop for the crane cab moves back and forth in the slot located in and along the length of the air duct, with conditioned air being blown continuously through the pick-up scoop and into the cab. The flexible flaps in the air duct slot remain in sealing engagement in front of the pick-up scoop and close in sealing engagement behind it as it travels back and forth through the air duct, thereby substantially preventing escape of air from the air duct or header except through the pick-up scoop and into the crane cab.

As shown in FIG. 5, in a situation where more than one crane is used in a particularly extended operation (three cranes 35 being shown in FIG. 5), more than one conditioned air supply unit 36 can be utilized for supplying the air duct 37 extending along the length of building 38 in which the cranes are located. In the arrangement shown in FIG. 5 the conditioned air supply units 36 are located outside of and at opposite ends of the building 38. Air supply lines 39 connect the units 36 to opposite ends of the air duct 37. It can be appreciated that one or more conditioned air supply units could be connected into the header at intermediate locations between its extremities.

It can be seen that the ventilating system embodying the invention successfully provides conditioned air for the operator in the cab of a travelling crane while avoiding contamination and fouling of the conditioned air supply unit. The ventilating system further has the effect of maintaining a positive pressure in the cab with respect to the ambient conditions outside the cab. Thus, ingestion of dirt particles into the cab is lessened and, more importantly, infiltration of noxious gases, such as carbon monoxide, is prevented.

Referring now to FIGS. 6 and 7 of the drawings, the invention is also useful in providing an exhaust system such as for travelling fume or exhaust hoods located over lines of equipment discharging noxious gases periodically, such as for example coke ovens. An exhaust system for such fume hoods is illustrated in FIGS. 6 and 7 as an embodiment of the invention. A travelling exhaust or fume hood 49, portions thereof being broken and cut away in the view of FIG. 6, is depicted traveling on tracks, only one track 50 being shown with wheel 51 running thereon. An elongated gas duct 52 is shown which has an exhaust line (not shown) connected thereto corresponding with air supply lines 39 shown in FIG. 5.

As with the system shown in FIGS. 2, 3 and 4, an elongated slot 53 is located in the gas duct 52 along the length thereof with the slot having spaced apart opposed edges 54 in the duct 52. A continuous sealing member 55 is located in and along the full length of the slot 53 normally sealing the slot against outward flow of noxious gases therethrough. The sealing member 55 has two flexible flaps 56 of elastomeric material, one flap being attached to one of the edges 54 and the other flap to the other of the edges 54. The flaps 56 are biased to normally bear against each other in sealing engagement, thereby providing a seal for the slot 53. This is accomplished by having outer sealing portions 57 on each of the flaps 56 located outside the elongated duct 52, each of the sealing portions 57 being curled substantially back on itself and having an open end 58. As before, the open ends 58 allow for a rolling action in the flaps 56 as exhaust scoop 59 passes back and forth through the slot 53. It can be seen that maintenance of a negative pressure in the duct 52, the system being under exhaust, causes the sealing portions 57 of the flaps 56 to be held in sealing engagement against each other.

The exhaust scoop 59 is attached to the exhaust hood 49 with one end 61 opening into the hood 49 and the other end opening into the gas duct 52. Advantageously, where high temperature noxious gases are being exhausted, the exhaust scoop 59 comprises an inner tube 62, attached to and opening into the hood 49 and opening at its other end into the duct 52, and an outer tube or sleeve 63 surrounding and spaced from the inner tube 62 (by way of attaching spacers 64). The outer sleeve 63 has open ends, with an outer end 65 exposed to ambient and an inner end 66 opening into the duct 52, thereby allowing cooling air to be drawn into it and to flow therethrough. The sealing portions 57 of the flaps 56 bear against a cooled surface and are prevented from becoming overheated by hot exhaust gases.

At least the sleeve portion 63 of the scoop 59 is of flattened oblong configuration on a cross section thereof with acutely radiused edges. These edges are located in the slot 53 between the flaps 56 to provide opening and closing of the slot as the scoop 59 travels therethrough with minimum gas leakage therefrom.

It can be seen that the operation of the system of FIGS. 6 and 7 is similar to that described with reference to the system of FIGS. 1 through 4 except that noxious gases are being drawn out through the exhaust system described and fresh air is being blown in through the ventilating or air conditioning system first described. It can be appreciated that for applications such as those illustrated with reference to FIGS. 1 to 5, a very long length of sealing member must be used which means that the flexible flaps must be made up in sections and the sections must be joined together. A mere abutment of sections is not possible because of expansion and contraction occurring due to temperature changes and overlapping of sections causes very severe problems in gas leakage and travel of the gas delivery scoop over overlapped portions. Thus, extreme wear
occurring on the scoop and the flaps can be torn or even dislodged from their positions. An advantageous joint 67 between sections 68, 69 of a flexible flap 70 is shown in FIG. 8. The section 68 has an outer end 71 overlapping inner end 72 of the section 69 and the two sections 68, 69 are joined together by connecting members, such as rivets 73. The outer end 71 is cut and arranged with a bevelled edge 74 which is at an acute angle to open end 75 of the flap 70. This arrangement facilitates smooth movement of the gas delivery scoop back and forth from one section to the other. Furthermore, the overlapping of sections provides for a good gas seal at joints in the flexible flaps. FIG. 8 clearly illustrates channel portions 76 on and integral with the flap 70 which are advantageous used for attachment to the gas duct. As shown in FIG. 8, the connecting rivets 73 are advantageously slidably located in matching slotted portions 77 cut in the sections 68, 69 of the flap 70. This allows for expansion and contraction of the sections of the flaps and for relative longitudinal movement between the flaps and the gas duct on which the flaps are located. It can be appreciated that any number of sections of flexible flap may be joined together as shown in FIG. 8 to provide a desired length of sealing member. It is noted that providing the sealing member in sections allows a damaged section to be repaired by removal of the damaged section and installation of a new section. Accordingly, sections adjoining the damaged section are not disturbed during the repair sequence.

FIG. 9 is a plan view of a sealing member 78 having flexible flaps 79, 80 comprising sections 81, 82 of the flap 79 and sections 83, 84 of the flap 80 joined to form joints as shown in FIG. 8. The joints in the flaps 79, 80 are advantageously arranged to have bevelled inner portions 85, 86 adjacent one another but not abutting to thereby provide the most effective seal possible at joints in the flaps.

Referring to FIG. 10 of the drawings, a different arrangement of a gas delivery scoop 87 and a sealing member 88 embodying the invention is shown in perspective. The scoop 87 has one end 89 opening into a moving vehicle being supplied with fresh air (not shown) by way of flexible hose 90 and end 91 is inserted between flexible flaps 92 of the sealing member 88 located on a gas duct (not shown) as previously described herein. The scoop 87 has plates 93 (see also FIG. 12 referred to hereinafter) of wear resistant material attached to each side thereof to provide riding surfaces for the flexible flaps 92 of the sealing member 88. Advantageously the plates 93 are of a material such as Teflon (trade mark) which is compatible with the sealing material and has a very low coefficient of friction thereby reducing wear on the flaps of the sealing member 88. Furthermore, the plates 93 are advantageously placed in a continuous strip around the periphery of the flattened, oblong end 91 of the scoop 87 (as shown in FIG. 10 and more clearly shown in FIG. 11 referred to hereinafter) and are designed to be quickly replaceable.

Referring to FIG. 11, which is a broken sectional view through line 11-11 of FIG. 10, the wear plates 93 are shown attached to and surrounding the end 91 of the scoop which is inserted between the flexible flaps 92. A cleaning or wiping action is set up by the scoop as it moves through the flaps as can be seen by close examination of FIG. 11 as a very small opening 94 is maintained ahead of the scoop where the flaps 92 are being separated. This cleaning or wiping action occurs by virtue of clean air issuing at high velocity out through the small opening 94 (in the case of a ventilating or air conditioning application), or entering the small opening (in the case of an exhaust application), whereby the flaps 92 are wiped clean of any dirt particles or other contaminants which have been deposited. This cleaning or wiping action cuts down wear on the flaps 92 and prolongs the life of wear surfaces 93 of the gas delivery scoop.

Referring now to FIG. 12, which is a sectional view through line 12-12 of FIG. 10, the advantageous rolling action of the flexible flaps 92 as the end 91 of the scoop passes therethrough is clearly illustrated. This rolling action allows for clean surfaces to be presented to the wear portions 93 of the scoop thereby preventing the rubbing of dirt particles into the flaps 92 and the wear portions 93 and prolonging the life of these components. It can be seen that lines A (seen as points in FIG. 12) where the flaps are touching in sealing engagement before entrance of the scoop (shown in broken outline as 92a) are rolled so as to be well away from contacting the scoop and are shown in position A'. This rolling action is a most advantageous feature of the present invention.

FIG. 13 illustrates another variation of scoop, sealing member and gas duct embodying the invention. In this embodiment scoop 95 is shown in a perspective view with oblong end 96 vertically inserted into and riding between flexible flaps 97 in sealing member 98. The flaps 97 are slidably clipped on to gas duct 99 which is rectangular in shape and has an inner casing 100 and an outer casing 101 with insulating 102, advantageously of the expanded type therebetween. The scoop 95 is seen to be longitudinally pivotally mounted by way of journal boxes 103 on supporting brackets 104. This arrangement allows for advantageous relative sideways motion between the gas duct 99 and the scoop 95 which is, of course, connected to and moving with the travelling vehicle being supplied with fresh air or exhausted, which vehicle can be subject to a certain amount of sideways motion as it moves along.

Referring to FIG. 14, the action of the pivotally mounted scoop 95 shown in FIG. 13 is illustrated. Thus, as the moving vehicle to which the scoop is attached sways from side to side the brackets 104 (only one being shown in FIG. 14) move back and forth between the positions shown by the solid and broken lines 104, 104a, the scoop being shown in positions 95, 95a respectively. The oblong end 96 (96a in the broken line position) of the scoop 95 is held between flexible flaps 97 and therefore the scoop 95 pivots in journal boxes 103 (103a in the broken line position) and the end 96 remains substantially centred between the two flaps 97, thereby maintaining a seal between the flaps and the gas scoop. As can be seen from FIG. 14, considerable relative motion between the scoop 95 and the gas duct 99 can be allowed for while still having some clearance 105, 105a between fastening edges 106 of the flaps 97.

The novel system of the invention has many and varied applications involving the supply of clean air to or exhaust removal from moving vehicles or equipment. In FIG. 15 a diagrammatic representation of a scale car 107 used for measuring charge materials to furnaces of various types is shown, which runs on tracks 108 and is situated in close proximity to the furnace or furnaces.
being fed, thereby being subjected to extreme heat and air pollution conditions. Cooling and ventilation of such cars has always been a problem, one which has never been satisfactorily solved. As can be seen from FIG. 15, the scale car 107 is necessarily quite open to the surrounding ambient so that operators 109 are subjected directly to the conditions of such ambient, being protected only by roof and siding structure 110. It has been found that the system of the invention provides ventilation from clean air, cool or warm, as necessary, in a fashion which substantially eliminates contact from the surrounding polluted ambient with the operators 109.

Elongated gas duct 111, cut away at the near end in the view of FIG. 15, is located along the full length of the tracks 108 on which the scale car 107 travels. Gas (in this case clean air) delivery scoop 112, with oblong end 113 inserted between flexible flaps 114, located in slot 115 of the duct 111, is shown supported on framework 116 on the car 107. Fresh air, either cool or warm as desired, is supplied under pressure to the duct 111 and this air passes into the scoop 112, through flexible lines 117 and air controller 118 into hood 119 and through louvers 120 to be directed as desired onto the operators 109 along the full length of the car 107. The end 113 of the scoop 112 slides back and forth in the gas duct as the car 107 moves back and forth.

It can be appreciated that the fresh air supply or exhaust system of the invention is, other than the elongated gas duct, attached to the travelling vehicle being ventilated or exhausted. Removal of the vehicle away from the elongated gas duct would involve disconnecting portions of the system. Accordingly, an exiting and re-entry arrangement embodied by that shown in FIG. 16 can be utilized, whereby disconnection of any part of the system is avoided. In the entry and exit portion shown in FIG. 16, gas duct 120 has a closed end section 121 thereon gradually decreasing in depth as shown so as to provide an inclined surface 122 thereon.

Slot 123 in the duct 120 has flexible sealing flaps 124 therein providing a continuous sealing member in which gas delivery scoop 125 rides (only a broken-away portion of the scoop 125 being shown). The slot 123 and the sealing flaps 124 follow the inclined surface 122 to end 126 (shown partially broken away) of the gas duct 120. Affixed under the section 121 are flexible sealing pads 127 which project up between the sealing flaps 124 in sealing engagement therewith and which are normally in sealing engagement with each other.

The pads 127 are attached to the section 121 of the duct 120 by way of strap members 128 and the pads gradually decrease in height from the end 126 to where the inclined surface 122 ends at the full depth section of the duct 120. It can be seen that when the scoop 125 is entering the duct in the direction of arrow 129 it progresses along the sealing pads 127 which provide a sealing action ahead of and behind the scoop 125 and the scoop finally enters the sealing flaps 124 and is fully contained in the flaps 124 while always maintaining the necessary sealing action for the duct 120. In exiting from the duct 120 the scoop reverses the aforesaid procedure. The entry and exit portion just described is seen to provide a simple disconnect system which completely avoids the necessity for detaching any parts of the ventilating system of the invention.

It can be appreciated that many travelling cranes have cabs which move transversely on rails located on the crane, which itself travels longitudinally. Such a crane 130 is shown in very simple representation in FIG. 17 which is travelling on rails 131 but on which cab 132 travels transversely on rails 133 (only one being shown in FIG. 17). In the embodiment of the invention an elongated air duct 134 is provided over the path of travel of the cab 132 and is mounted and supported on the crane superstructure by suitable support means 135. The air duct 134 is hereafter referred to as the crane duct to distinguish it from main air duct 136 located along one side of the path of travel of the crane 130. It is noted that the crane duct 134 has an elongated slot 137 and a continuous sealing member 138 and is in all respects identical to the design of the main duct 136 except that end 139 furthest away from the main duct 136 is sealed while end 140 closest to the main duct is connected to an air pick-up scoop 141. The air pick-up scoop 141 has one end attached to and opening into the end 140 of the crane duct 134 by way of hose 142 and the other end opening into the main duct 136. The end of the pick-up scoop 141 opening into the main duct is slidably inserted in slot 143 between flexible flaps 144 and is of the same oblong configuration as earlier described with reference to other figures of drawing. The travelling cab 132 has an air pick-up scoop 145 attached thereto and opening into the top thereof. The scoop 145 is positioned to be slidably inserted into the slot 137 between the flexible flaps 138 of the crane duct 134.

It can be appreciated that a constant volume controller such as that shown in FIG. 2 is advantageously included in the system, although for the sake of simplicity it is not shown in FIG. 17.

It can be seen that the ventilating system embodying the invention successfully provides conditioned air for the operator in the cab of a travelling crane wherein the cab travels transversely to the direction of travel of the crane itself.

What I claim as my invention is:

1. A ventilating system for a travelling gas-filled vehicle comprising a stationary elongated gas duct, a gas line connected in gas exchange relationship with said duct, an elongated slot located along the length of the gas duct, the slot having spaced apart opposed edges in the duct, a continuous sealing member in and along the full length of the slot and normally sealing the slot against flow of gases therethrough, said sealing member comprising two flexible flaps of elastomeric material, each flap having a sealing portion curled inwardly and substantially back on itself and with an open end, the open end being unattached and allowing a rolling action in the flap, one flap being attached to one edge and the other flap being attached to the other edge of the slot and the flaps being biased to bear against each other in sealing engagement and provide a seal for the slot, a gas delivery scoop, said scoop being attached to the travelling vehicle and having one end opening into the gas duct and the other end opening into the vehicle, the end of the scoop opening into the gas duct being slidably inserted in the elongated slot between the flexible flaps and being of flattened oblong configuration on a cross section thereof with acutely radiused edges, said edges being located in the slot to provide opening and closing of the slot with minimum gas leakage therefrom.
and a gas moving device connected to the gas line and
gas duct.
2. A system as claimed in claim 1 wherein each of the
flaps has a number of sections therein joined together
to make up the complete flap, the sections having joints
between them comprising outer and inner overlapping
ends joined together by connecting members, the outer
overlapping end being arranged at an acute angle to the
open end of the flap and having a bevelled edge to facili-
tate movement of the gas delivery scoop from one sec-
tion to another.
3. A system as claimed in claim 2 wherein the over-
lapping ends have matching slotted portions therein
and the connecting members are rivet members located
through and slidable in the slotted portions.
4. A system as claimed in claim 2 which is an exhaust
system for a travelling exhaust hood and wherein the
gas line is an exhaust line, each flexible flap has its seal-
ing portion located outside the elongated duct, the gas
delivery scoop is an exhaust scoop and an exhausting
device is connected to the exhaust line and the gas
duct.
5. An exhaust system as claimed in claim 4 wherein
the end of the exhaust scoop in the elongated slot has
a cross section of airfoil configuration.
6. An exhaust system as claimed in claim 4 wherein
an insulating sleeve is located around and spaced from
the exhaust scoop and having open ends, thereby pro-
viding a cooled surface for the flexible flaps, said insu-
lating sleeve having the flattened oblong configuration
on a cross section thereof with acutely radiusd edges.
7. A system as claimed in claim 2 which is a system
for supplying clean air to the travelling vehicle and
wherein the gas line is adapted to supply the clean air
to the duct, each flexible flap has its sealing portion lo-
cated inside the elongated duct and the gas delivery
scoop delivers the clean air to the travelling vehicle.
8. A system as claimed in claim 7 wherein the over-
lapping ends of the joints in the flaps have matching
slotted portions therein and the connecting members
are rivet members located through and slidable in the
slotted portions.
9. A system as claimed in claim 8 wherein a constant
volume controller is located between the gas delivery
scoop and the travelling vehicle with the scoop opening
into the controller and the controller opening into the
vehicle.
10. A system as claimed in claim 7 wherein the vehi-
icl is a travelling crane, the crane has a motor located
thereon and an exhaust fan is located on the crane hav-
ing an inlet connected to and exhausting air from the
cab and an outlet located to blow air on and through
the crane motor.
11. A system as claimed in claim 7 wherein the end
of the gas delivery scoop in the elongated slot has a
cross section of airfoil configuration.
12. A system as claimed in claim 2 wherein the gas
delivery scoop has plates of wear resistant material at-
tached to each side thereof to provide wear resistant
riding surfaces for the flexible flaps.
13. A system as claimed in claim 2 wherein the gas
delivery scoop is pivotally mounted longitudinally to
provide for relative sideways motion between the scoop
and the duct.
14. A system as claimed in claim 2 wherein an entry
and exit portion for the gas delivery scoop is provided
on an end of the duct having two flexible sealing pads
thereon normally closed to seal the end of the duct,
said pads having a depth decreasing from the end of the
duct and being arranged to allow the scoop to enter and
leave the duct and connect into and disconnect from
the sealing member while maintaining the duct sealed.

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