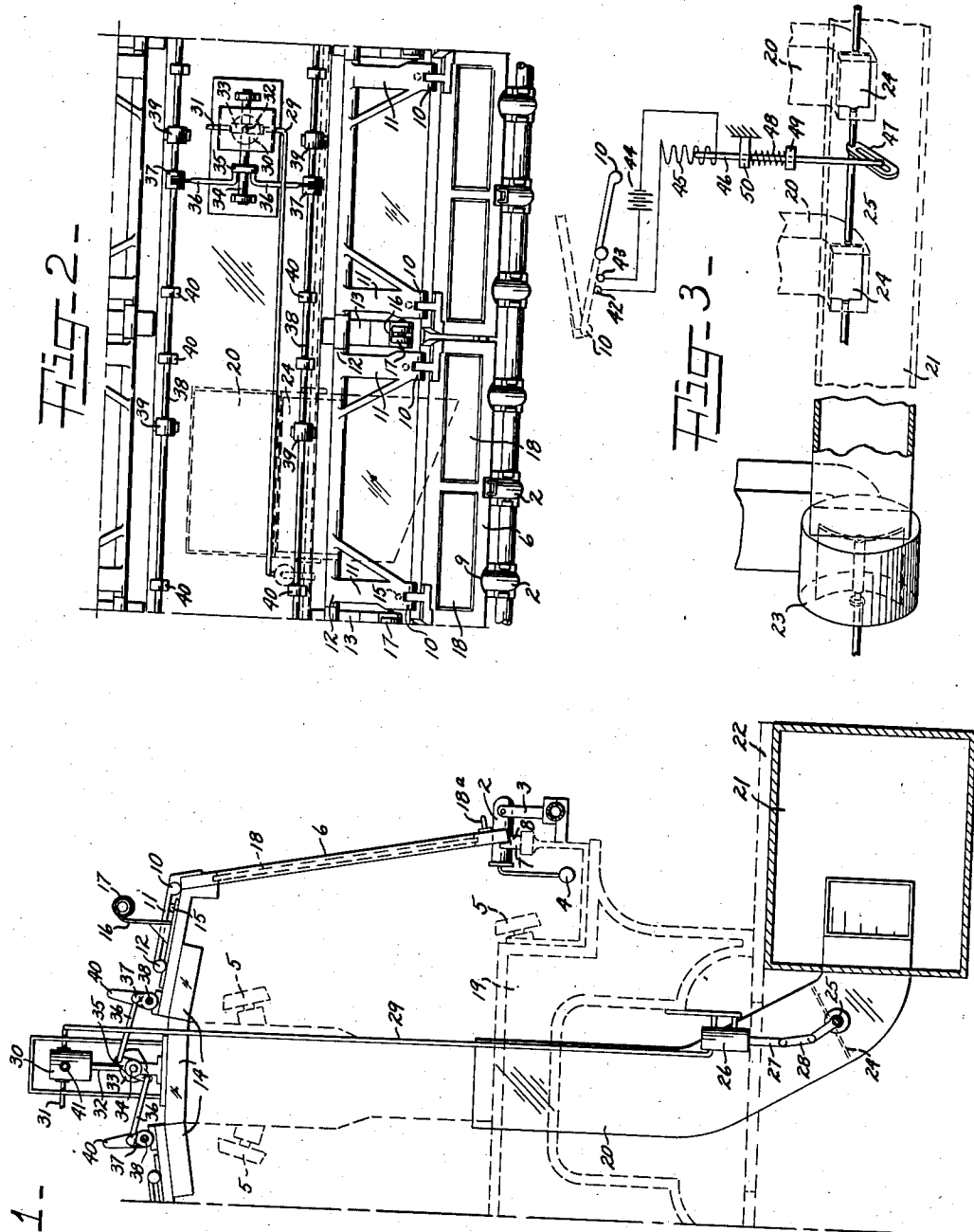


July 10, 1945.

J. J. BURKE  
SPINNING MACHINE CONTROL

2,380,147

Filed June 17, 1942



INVENTOR.  
JAMES J. BURKE  
BY  
Thomas R. W. Valley  
ATTORNEY.

## UNITED STATES PATENT OFFICE

2,380,147

## SPINNING MACHINE CONTROL

James J. Burke, Wilmington, Del., assignor to  
American Viscose Corporation, Wilmington,  
Del., a corporation of Delaware

Application June 17, 1942, Serial No. 447,445

6 Claims. (Cl. 18—8)

This invention relates to an enclosed type of machine for spinning rayon or similar synthetic filaments, by wet or dry spinning processes, to the interior of which suitable exhaust fans or blowers are operatively connected to reduce and substantially prevent the escape of gases or vapors into the surrounding atmosphere of the spinning room. More particularly, the invention is concerned with the provision of an arrangement for increasing and reducing the operation of the exhaust fans in response to the opening and closing respectively of the sash enclosing the spinning machine, thereby effectively preventing the escape of noxious gases into the spinning room atmosphere while economizing on the power consumption needed to operate the exhaust fans. Further objects and advantages of the invention will be apparent from the drawing and the description thereof hereinafter.

In the drawing, illustrative of the invention,

Figure 1 is a somewhat diagrammatic end elevational view of a spinning machine in which certain parts are shown in dotted outline.

Figure 2 is a plan view of a portion of the machine, and

Figure 3 is a diagrammatic view of a modified arrangement of the invention.

The invention will be described with reference to a particular form of sash shown in the drawing. It is to be understood, however, that the invention is not limited to a machine provided with this particular form of sash but may be readily adjusted and adapted to spinning machines provided with other types of sash. In the description hereinafter, the form of sash will first be described and then there will be described the connections by which operation of the sash effects variation in operation of the exhaust fans.

As shown in Figures 1 and 2, a spinning machine having on each side thereof a longitudinally arranged plurality of spinning stations having separate spinning candle filters 2 pivotally mounted on supports 3, spinnerets 4 and upper and lower godets 5, is enclosed by a plurality of suitable sash means 6. The lower edge of the form of sash shown rests on the frame of the machine against the support 7 which has offset portions 8 at spaced intervals for further supporting the base of the sash 6. Semicircular cut-out portions 9 are formed in the base of the sash to accommodate the filter candles 2.

The upper end of the sash 6 is hingedly mounted on a substantially horizontal axis at 10 to one end of a pair of parallel arms 11. The arms 11 are in turn hingedly mounted at their

other ends at 12 to fixtures 13 on the paneling 14 mounted on the framework of the machine to enclose the top thereof. Elements 15 of resilient material, such as rubber, may be provided to cushion the arms 11 as they are swung to close the sash and additional resilient elements may be provided for cushioning them as they are swung to the open position.

Between the arms 11 of the adjacent sash, there is provided a bracket 16 having an upwardly extending portion, preferably of spring metal, for rotatably supporting one or more roller bearings 17 (two being actually shown). These rollers 17 serve to support the frame of the sash 6 when opened so that it is completely over-head and out of the operator's way. Metallic or plastic runners may be fastened on the back of the frame of the sash 6 along their sides to take the wear caused by contact with the rollers 17. The sash may be so constructed that its center of gravity falls back of the rollers 17 when in the opened position.

The sash 6 are provided with panes 18 of glass or other transparent material, such as of vinyl or other resins. A handle 18a may be provided on the sash 6. The sash 6 are arranged, as shown in Figure 2, in close alignment to prevent the escape of gases and suitable gaskets may be provided on the machine framework to seal the machine to any desired extent.

As will be apparent from the description up to this point, the upper region of the interior of the machine is substantially completely enclosed by the paneling 14 at the top, the sash 6 along the sides and the lower framework of the machine 19. Opening into the enclosed regions of the interior of the machine, there are provided a plurality of ducts 20 spaced at suitable intervals along the length of the machine. These ducts 20 lead downwardly to a common duct 21, which is shown as being positioned beneath the floor 22 of the spinning room. The common exhaust duct 21 is connected to a suitable exhaust fan 23 (see Figure 3) driven by a motor (not shown). Each of the tributary ducts 20 is provided with a damper 24 all of which are mounted upon a common shaft 25 extending through all of the tributary ducts 20 associated with the machine. An air-operated motor 26 is mounted upon the frame of the machine preferably near the middle of the common shaft 25 upon which the dampers 24 are mounted. The piston rod 27 of the air motor is connected by a suitable linkage 28 to the common damper shaft 25. An air line 29 connects the air motor 26 to an air valve

30 which controls the admission of air thereto from the supply line 31. The air valve has a valve rod 32 extending downwardly therefrom into contact with a cam 33 which is mounted for rotation with a cross shaft 34 mounted in suitable bearings upon the paneling or other framework of the machine. A symmetrical crank lever 35 is secured upon the cross-shaft 34 and suitable links 36 pivotally mounted on the ends of the crank lever 35 are connected to crank levers 37 mounted upon two parallel shafts 38 extending the full length of the machine on each side thereof. Each of these parallel shafts 38 is rotatably supported within suitable bearings 39 spaced at intervals along the machine and is provided with upstanding levers 40 fixedly secured thereon. One of these levers 40 is arranged to be swung in a counter-clockwise direction by one of the arms 11 of each sash 6 on the machine. While Figure 2 shows one such lever arranged for cooperation with both arms 11 of each sash, one is sufficient. Each of the two parallel shafts 38 may be provided with one or more torsion springs (not shown), preferably one at each end of each shaft for returning the shafts with the levers thereon to the positions shown in Figure 1 upon closing of the last sash on each side of the machine. These springs may consist of an ordinary helical spring fastened at one end to a fixed part of the frame and at the other end to a collar fixed to the shaft.

In operation, upon opening the sash, one of its arms 11 as it is being laid back in its rest position (see dotted line position in Figure 3) turns the lever 40 with its shaft 38 in a counter-clockwise direction which motion is transferred by the crank lever 37, link 36 and crank lever 35, to cross-shaft 34. Rotation of the cross-shaft 34 causes the cam 33 to rotate so that a rise thereon causes the valve rod 32 to be moved upwardly thereby opening the air line 29 to the air supply line 31. The rush of air through the air line to the air motor 26 forces a piston therein downwardly against a spring therein so that the rod 27 is depressed thereby turning the damper shaft 25 in a counter-clockwise direction to open the dampers 24. It will be apparent from the drawing that as long as any one sash 6 on the machine remains open the dampers 24 remain open. When the last of the sash 6 is closed, the torsion springs on shafts 38 cause their return to the position shown, in Figure 1, thereby closing the valve 30 and opening the air line 29 to an exhaust outlet 41 associated with the valve 30. Instead of having a three-way valve with an exhaust part 41 as just described, the valve 30 may be an ordinary two-way valve and the air line 29 to the air motor may be provided with a restricted orifice which is insufficient in size to interfere with the rush of air to the air motor when the valve is opened but which, upon closing of the valve, permits the air motor under the action of its spring to return to normal position to close the dampers.

Since most exhaust fans and electric motors which are employed for exhausting gases, such as would be used with the exhaust duct of this machine, are self-adjusting, that is they automatically adjust the power output and consumption to the load to which they are subjected, it is readily seen that the opening of the dampers of the machine by the opening of the sash effectively increases the operation of the fan when it is needed and that when the sash is thereafter

closed, a corresponding reduction of power consumption is effected.

While a single air motor is disclosed for operating all of the dampers in the various tributary ducts as a unit upon the opening of a single sash, the connections may be altered so that a separate valve and air motor are provided for each tributary duct and parallel shafts (corresponding to shafts 38) associated with the given air valve may extend only along the portion of the machine adjacent that tributary duct so that the damper in that duct will be opened only when the sash in the neighborhood thereof is opened.

While a mechanical linkage is shown in Figures 1 and 2 for operating an air motor which in turn opens and closes the dampers, other types of linkage may be employed, such as an electrical connection of the type shown in Figure 3. As there shown, the two parallel shafts 38 of Figures 1 and 2 are replaced each by a pair of parallel conductors or bus bars 42 and 43 suitably supported so as to be electrically insulated from the rest of the machine. Each of these conductors forms one terminus or pole of a circuit including a source of electrical energy 44 and a solenoid 45 arranged to retract a core 46 connected by a suitable linkage 47 to the damper shaft 25 when current is passing therethrough. Whenever a sash 6 is opened, the arms 11, which are made of metal or which may have a portion thereof made of metal for contacting the two conductors 42 and 43, shorts the two conductors, thereby closing the circuit and causing opening of the dampers. A spring 48 may be provided to be compressed by collar 49 on the core against a stationary guide 50 for returning the dampers 24 to closed position when the current ceases upon the closing of all of the sash 6. If desired, the solenoid may act upon the valve rod 32 of the air valve 30 in the arrangement of Figures 1 and 2 rather than upon a core, such as 46 in Figure 3, which directly retracts and opens the dampers through the link 47. As another alternative, the two conductors 42 and 43 of Figure 3 may be replaced by a single conductor in a circuit including a capacitance relay adapted to be operated upon variation of the capacitance of the circuit as a result of contact of the arms 11 of the sash with the conductor, the relay being arranged to effect operation of either the rod 32 of the air valve of Figures 1 and 2 or a solenoid operating upon a core for turning the damper shaft as in Figure 3. Another alternative arrangement comprises the placing of push-button switches in the support 7, one switch for each sash in parallel across two conductors, corresponding to 42 and 43 and connecting them in the electrical circuit of Figure 3 so that opening a sash permits a spring to operate the push-button to close the circuit and open the dampers.

It is to be understood that changes and variations may be made without departing from the spirit and scope of the invention as defined by the appended claims.

What I claim is:

1. In a machine for spinning rayon and the like, means for substantially enclosing a region of the machine to thereby hinder the escape of gases or vapors to the surrounding atmosphere of the spinning room comprising readily openable members to afford access to portions of the machine, a duct system communicating with the enclosed region, fan means for continuously withdrawing gases and vapors through the duct system from the enclosed region of the machine,

damper means in the duct system for controlling the withdrawal, and means operated by said members for increasing and decreasing the extent of opening of said damper means when said enclosure is opened and closed respectively by said members.

2. In a machine for spinning rayon and the like, means for substantially enclosing a region of the machine to thereby hinder the escape of gases or vapors to the surrounding atmosphere of the spinning room comprising sash members to afford access to portions of the machine, a duct system communicating with the enclosed region, fan means for continuously withdrawing gases and vapors through the duct system from the enclosed region of the machine, damper means in the duct system for controlling the withdrawal, and means operated by said sash members for increasing and decreasing the extent of opening of said damper means when said enclosure is opened and closed respectively by said sash members.

3. In a machine for spinning rayon and the like, means for substantially enclosing a region of the machine to thereby hinder the escape of gases or vapors to the surrounding atmosphere of the spinning room comprising sash members to afford access to portions of the machine, a duct system communicating with the enclosed region, means for continuously withdrawing gases and vapors through the duct system from the enclosed region of the machine, damper means in the duct system for controlling the withdrawal, and pneumatic means operated by said sash members for increasing and decreasing the extent of opening of said damper means when said enclosure is opened and closed respectively by said sash members.

4. In a machine for spinning rayon and the like, means for substantially enclosing a region of the machine to thereby hinder the escape of gases or vapors to the surrounding atmosphere of the spinning room comprising sash members to afford access to portions of the machine, a duct system communicating with the enclosed region, means for continuously withdrawing gases and vapors through the duct system from the enclosed region of the machine, damper means in the duct system for controlling the withdrawal,

electrical means operated by the sash members for increasing and decreasing the extent of opening of said damper means when the enclosure is opened and closed respectively by the sash members.

5. In a machine for spinning rayon and the like, means for substantially enclosing a region of the machine to thereby hinder the escape of gases or vapors to the surrounding atmosphere of the spinning room comprising sash members to afford access to portions of the machine, means for continuously withdrawing gases and vapors from the enclosed region of the machine comprising a plurality of ducts tributary to a main exhaust duct, fan means in the main exhaust duct and damper means in said tributary ducts for controlling the withdrawal of the gases and vapors from the enclosed region of the machine, means operated by the sash members for increasing and decreasing the extent of opening of the damper means when the enclosure is opened and closed respectively by the sash members.

6. In a machine for spinning rayon and the like, means for substantially enclosing a region of the machine to thereby hinder the escape of gases or vapors to the surrounding atmosphere of the spinning room comprising an upper paneling and sash means, means for mounting the sash means comprising a member pivotally attached at one end adjacent the upper end of the sash means and at its other end to the paneling whereby the sash means may be swung upwardly to a position substantially above the machine, a spring-biased shaft extending the length of the machine, levers secured to said shaft at spaced intervals and arranged to be swung with said shaft in opposition to the biasing thereof by said member when a sash is opened, means for continuously withdrawing gases and vapors from the enclosed region of the machine comprising a plurality of ducts tributary to a main exhaust duct, damper means in said tributary ducts for controlling the withdrawal of the gases and vapors therefrom, an air motor for opening and closing said damper means, and cam means operated by said shaft for opening and closing an air valve controlling admission of air to said air motor.

JAMES J. BURKE.