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E. C. GREMBECKI

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DAMPENER FOR PRINTING PRESSES

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Fig. 1.

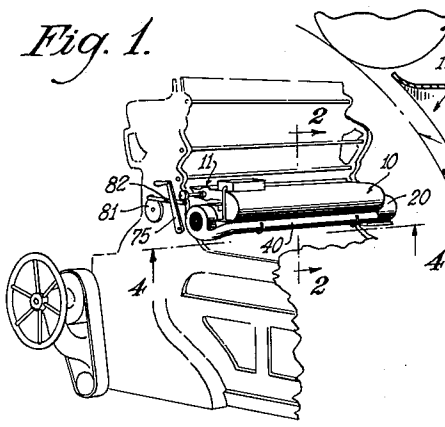


Fig. 2.

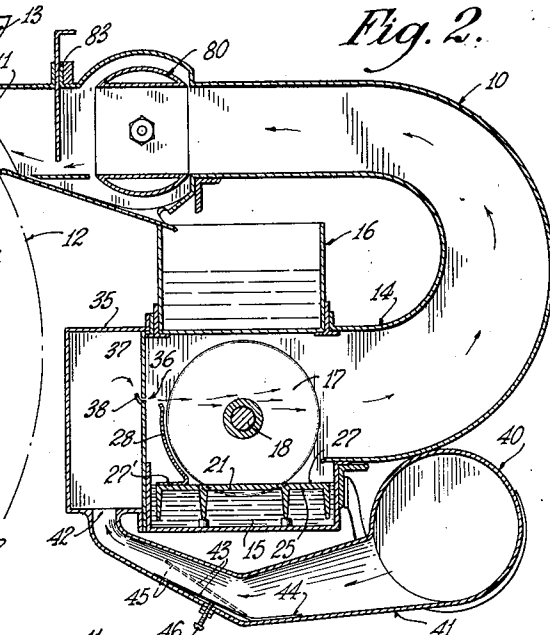


Fig. 3.

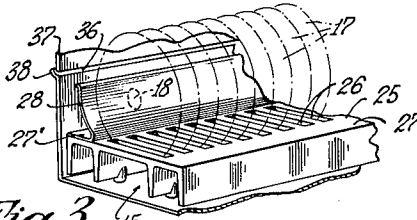
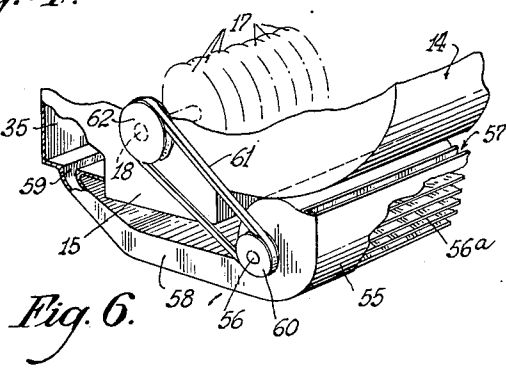
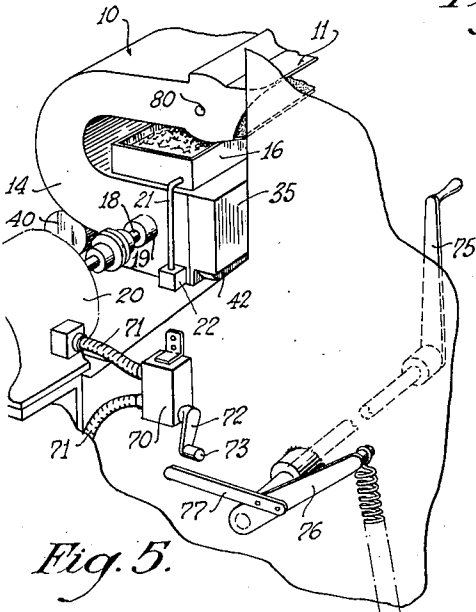
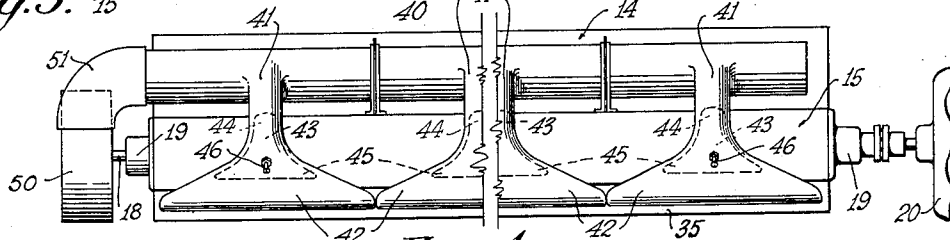


Fig. 4.



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# UNITED STATES PATENT OFFICE

2,196,412

## DAMPENER FOR PRINTING PRESSES

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Application July 25, 1938, Serial No. 221,069

20 Claims. (Cl. 101-147)

This invention relates to printing apparatus and more particularly to dampening mechanism for lithographic and analogous types of printing press, one of the principal objects of the invention being the provision of certain improvements in dampening mechanism of the type disclosed in my U. S. Patent 2,108,984 and my copending U. S. application, Serial No. 152,927.

Particularly stated, the invention includes a housing having a discharge opening adapted to confront a press roller, a source of water in the housing remote from the discharge opening, and means for delivering air under pressure into said housing either for the purpose of breaking up the water into fine particles and driving the water toward said discharge opening or for driving the water toward the discharge opening when some form of atomizing mechanism distinct from the compressed air is provided for atomizing purposes, the invention particularly providing an air chamber arranged and constructed to direct compressed air into the housing at a suitable point, and a system of ducts for directing compressed air into the chamber in a particular manner to secure uniform air pressure.

Another object is the provision of means for providing uniform air pressure in a press dampening mechanism, said means including an air chamber arranged and constructed to extend substantially the width of the press roller and having openings through which air issues for the purpose of driving a water spray or mist toward the roller across its entire length, a second air chamber of a length substantially the same as that of the first chamber, means for setting up an air pressure in the second chamber, and a system of ducts connecting the first and second air chambers so as to secure a proper distribution of the air in the second chamber, with a consequent even distribution of the water spray or mist on the press roller.

Another object is the provision of dampening mechanism including a first air chamber extending substantially the length of a press roller and having openings throughout its length through which air under pressure may issue to drive a uniform water spray or mist onto the roller throughout its length, a second air chamber of a length substantially equal to that of the first chamber, duct means connecting said chambers, and blower mechanism in the second chamber and arranged either for connection with a separate driving means or for driving cooperation with a motor-driven chopper or atomizer.

A further object is the provision of control

mechanism for dampening apparatus of the type characterized and which includes a power-driven atomizer and air compressor or blower, each driven by separate motors or by the same motor, the control mechanism including switch means for said motor or motors and manually operable lever mechanism adapted to actuate the switch and move certain press rollers, such as the inking and impression rollers, into and out of driving engagement with a plate roller, the power means for the dampening mechanism being cut-off when the press is idle.

Still another object is the provision of an improved guard means for cooperation with a water atomizer used in conjunction with dampening mechanism of the type characterized.

Other objects and novel aspects of the invention reside in certain details of construction as well as the location and operation of various parts hereinafter to be described in view of the annexed drawing in which:

Fig. 1 is a perspective view of a printing press employing the present improvements;

Fig. 2 is an enlarged fragmentary vertical section taken along line 2-2 of Fig. 1;

Fig. 3 is a fragmentary perspective of the guard means for the atomizer;

Fig. 4 is a bottom plan of the dampening mechanism looking in the direction of line 4-4 of Fig. 1;

Fig. 5 is a schematic perspective of the control mechanism; while

Fig. 6 is a fragmentary perspective of a modified form of blower.

Referring to Figs. 1 and 2, the dampening mechanism includes a housing 10, preferably of the type disclosed in my aforesaid patent and copending application, and which is designed to provide an elongated air path extending throughout the length of the press rollers.

In the present arrangement, the housing 10 has a discharge opening or mouth 11 formed at one end and arranged to closely confront a plate roller 12 throughout the length of the latter, it being understood, however, that in those installations where the dampening is effected on the ink roller 13, the housing 10 may be mounted so that its discharge mouth 11 will confront the ink roller, or any other roller which it is desirable to dampen.

The housing in the present embodiment is preferably of U-shaped, the advantages of this shape being emphasized in the aforesaid patent and providing, among other things, an elongated path over which the variously dimensioned water

particles must pass before reaching the plate cylinder, so that not only are the particles uniformly arranged by the time they reach the cylinder, but the heavier particles are settled out due to the shape of the housing as well as the length of the path.

The housing has a lower portion 14 of the same length as the upper portion and formed with a trough 15 in its bottom, there being another trough 16 above the first-mentioned trough and from which a fall of water descends across the width of the lower portion of the housing, as shown in my aforesaid patent, or the water from the upper trough may be fed through a pipe and float valve control 21—22 (Fig. 5), as in my aforesaid pending application, so as to maintain a normal water level in the trough.

Atomizing means in the preferred form of a series of chopper discs 17 (see also Figs. 3 and 6) are mounted in a series on a shaft 18 which extends throughout the length of the lower section 14 of the housing and which is supported in journals 19 (Fig. 5) in the opposite end walls of the latter. The bottom portions of the disc 17 normally extend into the water contained in the lower trough 15, the shaft 18 being connected with some form of driving means, such for example as the electric motor 20 (Fig. 5), to effect rapid rotation of the discs so that the falling water from trough 16 (if the spray feed be used), as well as water picked up from the trough 15, will be thrown into space in fine particles and in the general direction of the discharge end 11 of the housing.

Improved means for preventing pockets and water whirls in the water in the trough 15 includes a sort of grating 25 (Fig. 3) having a plurality of parallel bars 26 disposed between each of the discs 17 and surface portions 27 flanking the discs on opposite sides thereof at their juncture with the normal level of water in trough 15 in such manner that each portion of the discs 17 contacting the water in trough 15 is guarded in the region of its juncture with the normal surface level of the water by portions of the grating. This arrangement is effective to prevent formation of pockets in the water regardless of the speed at which the discs are rotated. If desired, a shield 28 may be attached to the rearmost surface section 27' on the grating to reduce the splash in the direction of the air chamber, as will be brought out hereafter.

Means for effecting the movement of a uniform spray or mist toward the discharge end of the housing, includes the provision of a first air chamber 35 (Fig. 2) at the rearward end of the lower section 14 of the housing, there being a horizontally extending slit 36 provided in a wall portion 37 separating the chamber from the housing, the slit being disposed at a level somewhat above that of the shaft 18 for best results. A small splash guard 38 is preferably provided on the inner side of the partition 37 opposite the slit 36 to further reduce any splash from the discs 17 not effectively stopped by the guard 28.

It is important that the air pressure throughout the chamber 35 be kept as uniform as possible and to this end the present improvements provide the arrangement of a second air chamber 40 conveniently located beneath the housing 10 at a distance from the first chamber 35, the second chamber 40 being of a length equivalent to that of the first chamber, that is, equal to the length of the usual press roller.

The second chamber 40 is conveniently re-

ferred to as the pressure chamber, and it is desirably connected with the main or distributing chamber 35 by a plurality of duct members 41 each having a flared mouth portion 42 communicating into the under side of the main chamber 35, these mouth portions being constricted (Fig. 2) relative to the juncture of the ducts with the pressure chamber 40. This arrangement provides for constant pressure throughout the length of the main chamber 35. Pressure regulating means includes the provision in each of the flared duct portions 42 of a baffle or vane 43 attached near one end 44 to the inner side of the corresponding duct and having a widened opposite end portion 45 (Fig. 4 also) which projects up into the widened part of the duct. Adjusting means such as screws 46 threaded into the several ducts may be turned against the vanes 43 to urge the nose portions 45 of the latter into the blocked dotted-line positions indicated in Fig. 2, whereby to choke the air moving from the pressure chamber.

In the arrangement of Fig. 4, means for maintaining the air pressure in the chamber 40 includes a blower 50 arranged at the opposite end of the shaft 18 to the connection thereof with the motor 20, the blower having its discharge side 51 connected with one of the ends of the chamber 40.

A modified arrangement of the pressure means of Fig. 4 is shown in Fig. 6 wherein an elongated pressure chamber 55, similar to the chamber 40, is mounted beneath the lower portion 14 of the housing and has an elongated blower element 56a mounted on a shaft 56 journaled in the opposite end walls of the chamber. The chamber 55 is provided with an elongated intake opening 57, and a constricted discharge duct 58, similar in operating principle to the duct means 41—42 of Figs. 2 and 4, in that its juncture with the chamber 55 is wider than the opposite discharge end 59 thereof which connects with the under side of the main air chamber.

The mouth of the discharge duct 58, in contrast to the arrangement of Fig. 4, extends throughout the length of the chamber 55. Means for driving the self-contained blower in the arrangement of Fig. 6, includes a pulley 60 on the shaft 56, driven by a belt 61 on a pulley 62 arranged on the end of the main chopper or atomizer shaft 18. By this arrangement, the chopper and the blower are driven by the same motor 20, however, if convenient, a separate motor may be connected directly with the shaft 56 and electrically connected with the motor 20 for unitary control.

An improved control mechanism is shown in Fig. 5 and includes a control element or switch 70 electrically connected with the motor 20 and a power source through the conduits 71 and including an oscillable operating crank 72 provided with a roller 73. In the type of press chosen for illustration there is a main manual control crank 75 arranged on one side of the press near an end of the plate roller (Figs. 1 and 5) and connected through a lever system 76 with certain of the press rollers such as the impression and ink rollers, such that when the crank 75 is depressed, these rollers will be moved out of engagement either with the driven plate roller or some other driving roller.

The control or switch-operating member 72 is arranged for actuation by means such as the arm 77 attached to the lever 76, the roller 73 being so positioned with respect to the means 77

that when the operating crank 75 is depressed to idle the press and lift the rollers, the control arm 72 will be moved to shut off the motor 20, thus stopping the atomizing mechanism, as well as the blower 50 or the blower drive shaft 56 in the self-contained blower arrangement of Fig. 6. The switch 70 obviously may simultaneously control any separate motor means provided for the blower shaft 56, as heretofore suggested.

10 In operation, the motor 20 is energized automatically when the master manual control 75 is actuated to drive the ink and impression rollers with the plate roller, thus rotating the chopper shaft 18 so that water falling from the trough 16, as well as water below the grate 25, is picked up by the disc 17 and thrown into space in the lower housing section 14. In the arrangement of Fig. 4, the blower 50 is driven directly from the shaft 18 and builds up pressure in the pressure chamber 40, which pressure is distributed through the constricted ducts 41-42 into the main distributing chamber 35 from which the compressed air issues through the elongated slot 36 to pick up the atomized particles and move the same bodily in the form of a mist into the upper section of the housing and through the mouth 11 into the plate or ink roller, the water particles being very fine and of uniform size and distribution. Automatic shutter means 80 cooperably driven through a cam mechanism 81-82 actuated by the main plate roller, periodically cuts off movement of the mist once during each revolution of the plate roller, and adjustable baffles 83 may be positioned throughout the length of the housing to distribute the deposit variously along the length of the rollers.

Where the arrangement of Fig. 6 is preferred, the blower means 50 is dispensed with, and the self-contained blower is provided in the chamber 55 to build up pressure in the latter, which pressure is fed through the constricted duct unit 58 into the bottom of the chamber 35 with substantially the results achieved as described in conjunction with the arrangement of Fig. 4, the operation of the remainder of the apparatus being substantially the same.

While I have described the preferred embodiment in details for purposes of illustration, it will be apparent that changes may be made in the form, location, and operation of the specified apparatus, and the invention is therefore not to be restricted to any such details except as may be provided in the appended claims.

Having thus described my invention, what I claim as new and desire to protect by Letters Patent is:

1. In a dampener for a printing press, means providing a housing having a discharge opening confronting a press roller along the length of the latter, means providing a source of particulated water in said housing, a main air chamber communicating into said housing at a point remote from said opening and along a path parallel thereto, a pressure chamber extending collaterally of said main air chamber and means for maintaining a predetermined air pressure therein, and duct means communicating from said pressure chamber into said main chamber along a path collateral to the length of said roller.

2. In a dampener for a printing press, means providing a housing having a discharge opening confronting a press roller along the length of the latter, means providing a source of particulated water in said housing, a main air chamber communicating into said housing at a point re-

5 mote from said opening and along a path parallel thereto, a pressure chamber extending collaterally of said main air chamber and means for maintaining a predetermined air pressure therein, and duct means communicating from said pressure chamber into said main chamber along a path collateral to the length of said roller and being relatively constricted at its juncture with the main chamber.

3. In a dampener for a printing press, means providing a housing having a discharge mouth confronting a member of the press, the width of said housing and mouth extending collaterally of said press member, means providing a source of finely divided water particles in said housing, and air pressure means for moving said particles toward said mouth onto said press member and including a main elongated air chamber arranged with its length parallel to the width of said housing and mouth and communicating throughout its length into said housing along a path substantially collateral to, and at a point remote from, said mouth and behind said water source relative to the mouth, a pressure chamber of a length substantially equal to that of said main chamber and arranged with its length parallel to the latter and said mouth, and duct means connecting said pressure chamber and said main chamber substantially throughout the length of each, together with means for maintaining air pressure in said pressure chamber.

4. In a dampener for a printing press, a housing having a mouth arranged opposite the length of a press roller, an air distributing chamber positioned at a remote end of said housing opposite said mouth and having air passage means arranged to extend across said housing along a line substantially parallel with the length of said roller, and a pressure chamber communicating with said distributing chamber at points along a line substantially parallel with the length of said roller, and means providing a source of particulated water in said housing in the path of air from said distributing chamber.

5. In a press dampener, a housing having a width substantially equal to that of a press roller and having a discharge mouth arranged closely opposite said roller throughout the length thereof, an air distributing chamber extending across the width of said housing and having air discharge means arranged substantially across the width of the housing and substantially parallel to the length of said roller, a pressure chamber also extending the width of said housing, and duct means feeding from said pressure chamber along a path across the width thereof into said distributing chamber along a path across the width of the same and substantially parallel to the length of said roller, means for generating air pressure in said pressure chamber, and means providing a source of water particles in said housing, said particles being carried to said discharge mouth by air issuing from said distributing chamber.

6. In a press dampener, a housing having a width substantially equal to that of a press roller and having a discharge mouth arranged close to said roller and extending collaterally therewith, an air distributing chamber extending across said housing, and means providing communication from said air chamber into said housing substantially all the way across the latter and at an end of the housing remote from said discharge mouth, a pressure chamber and means for maintaining a desired air pressure therein, said pres-

sure chamber being of a length at least equal to the width of said discharge mouth, means for projecting water into space in said housing in the path of air from said distributing chamber, and duct means communicating from said pressure chamber throughout its length into said distributing chamber substantially throughout the length of the latter as measured across said housing, said duct means having a greater cross-sectional area in the region of its juncture with said pressure chamber than at its juncture with said distributing chamber.

7. In a printing press dampener, a housing having a discharge mouth extending the length of a press member to be dampened, a main air chamber having air discharge means arranged therein and issuing into said housing along a line substantially collateral with said press member, means for projecting water into space in said housing and in the path of air from said main chamber, a pressure chamber and means for maintaining a desired air pressure therein, and a plurality of air feeding ducts leading from said pressure chamber at points spaced along the length thereof and into said main chamber at points spaced along the length of the same and along a path parallel to said discharge mouth, said ducts being widened in the direction of the length of said main chamber at their juncture with the same.

8. In a device of the class described, a housing, power-driven atomizing means in said housing for breaking up water therein into fine particles, an air distributing chamber communicating with said housing, a pressure chamber having communication with said distributing chamber, and driven means for maintaining air pressure in said pressure chamber and cooperably driven with said atomizing means.

9. In a press dampener, air pressure means including an air distributing chamber and coacting atomizing means, a pressure chamber, and constricted duct means connecting said chambers.

10. In a dampening mechanism, a housing and rotatable water atomizing means therein, motor means driving said rotatable means, and air pressure apparatus including an air distributing chamber communicating into said housing, an air pressure chamber, a blower driven cooperably with said rotatable means by said motor means, and means providing for passage of air from said pressure chamber into said distributing chamber.

11. In a dampening apparatus, a housing having a discharge mouth, means providing a source of water in said housing, rotatable water particulating means in said housing and including a drive shaft having end portions exposed on opposite sides of said housing, motor means connected with one exposed end of said drive shaft, a blower mounted at the opposite end of said shaft and drivingly connected therewith, a pressure chamber connected to the output of said blower and mounted beneath said housing, and an air distributing chamber having communication with said pressure chamber and said housing and effective to direct air into the particulated water to move the same toward said discharge mouth.

12. In a dampening apparatus, a housing having a discharge mouth, means providing a source of water in said housing, a rotatable water atomizing device including a drive shaft extending through opposite side parts of said housing, an air pressure chamber extending across the width

of said housing and including a blower element rotatable about an axis substantially parallel to that of the aforesaid drive shaft, means coupling said shafts for driving cooperation, and motor means drivingly connected with one of said shafts, and means for distributing air from said pressure chamber into said housing.

13. In a device of the class described, atomizing mechanism including a plurality of spaced coaxially rotated members and means providing a supply of water through which said members rotate, and means for preventing air pockets and whirls about said members and including a guard member disposed in said water and having a plurality of openings therein and through each of which a portion of one of said coaxially rotated members projects into contact with said water.

14. Atomizing apparatus including a water trough, a guard in said trough and having a surface portion in spaced relation to the bottom of said trough, said surface portion having a plurality of parallel openings communicating there-through into said water, and means including a plurality of rotated disc-shaped choppers mounted in axially spaced relation on a common shaft and each having an edge portion projected into said water through one of said parallel openings in the guard, and means for rotating said common shaft.

15. Atomizing apparatus including a water trough, a guard in said trough and having a surface portion in spaced relation to the bottom of said trough, said surface portion having a plurality of parallel openings communicating there-through into said water, and means including a plurality of rotated disc-shaped choppers mounted in axially spaced relation on a common shaft and each having an edge portion projected into said water through one of said parallel openings in the guard, and means for rotating said common shaft, said guard having a shield mounted thereon and extending upwardly away from the guard behind said choppers on the side thereof rotating toward the guard.

16. In combination with a printing press including a manual control for moving press rollers, dampening mechanism including a driving motor and water atomizing means driven thereby, motor control means for starting and stopping said motor, and mechanism arranged to actuate said motor control means cooperably with said manual control whereby to effect starting and stopping of said atomizing means when said press rollers are moved into and out of predetermined positions by operation of said manual control.

17. In combination, a printing press having a driven plate cylinder and roller means arranged and provided with idling control mechanism for moving said roller means into and out of operative engagement with said plate cylinder, and dampening mechanism including a driven water atomizer, driven air moving means arranged to carry atomized water to a point of utilization, motor means for driving said atomizer and said air moving means, a control for starting and stopping said motor means, and mechanism linking said idling control mechanism for coaction with said motor control whereby to effect a stopping and starting of said motor means correspondingly with movement of said roller means into and out of operative engagement with said plate cylinder.

18. In a device of the class described, means for moving water particles or water mist through a housing onto a press roller positioned before a discharge mouth provided in said housing, said

means including a pressure chamber and means for maintaining a desired air pressure therein, an air distributing chamber arranged to extend in a direction across the width of said housing parallel with the axis of said roller, said distributing chamber having an air escape slit communicating with said housing across the width of the latter at an end thereof remote from said mouth, said slit extending parallel with said axis of the roller, and duct means interconnecting said pressure chamber and distributing chamber throughout the extent of each.

19. In a device of the class described, means for moving water particles or water mist through a housing onto a press roller positioned before a discharge mouth provided in said housing, said means including a pressure chamber and means for maintaining a desired air pressure therein, an air distributing chamber arranged to extend in a direction across the width of said housing parallel with the axis of said roller, said distributing chamber having an air escape slit communi-

cating with said housing across the width of the latter at an end thereof remote from said mouth, said slit extending parallel with said axis of the roller, and duct means interconnecting said pressure chamber and distributing chamber throughout the extent of each, said duct means being constricted at its juncture with said distributing chamber.

20. In a press dampener, a moisture confining member having a discharge mouth arranged to confront a press roller, a main air chamber provided with air exit means arranged to discharge air into said confining member along a path substantially parallel to said roller, a pressure chamber discharging through constricted orifice means into said main air chamber along a path substantially parallel to said discharge path in the confining member, means for generating air pressure in said pressure chamber, and means for projecting water into space in said housing in the path of air from said main chamber.

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