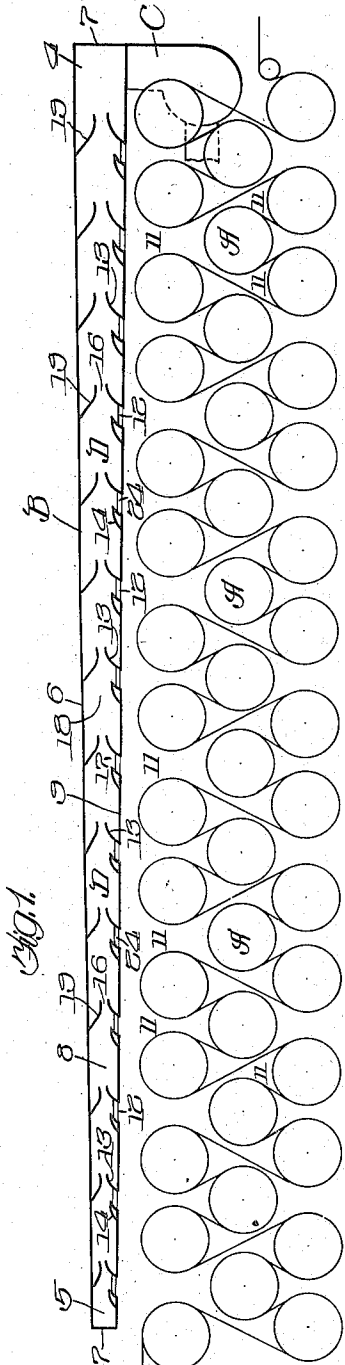


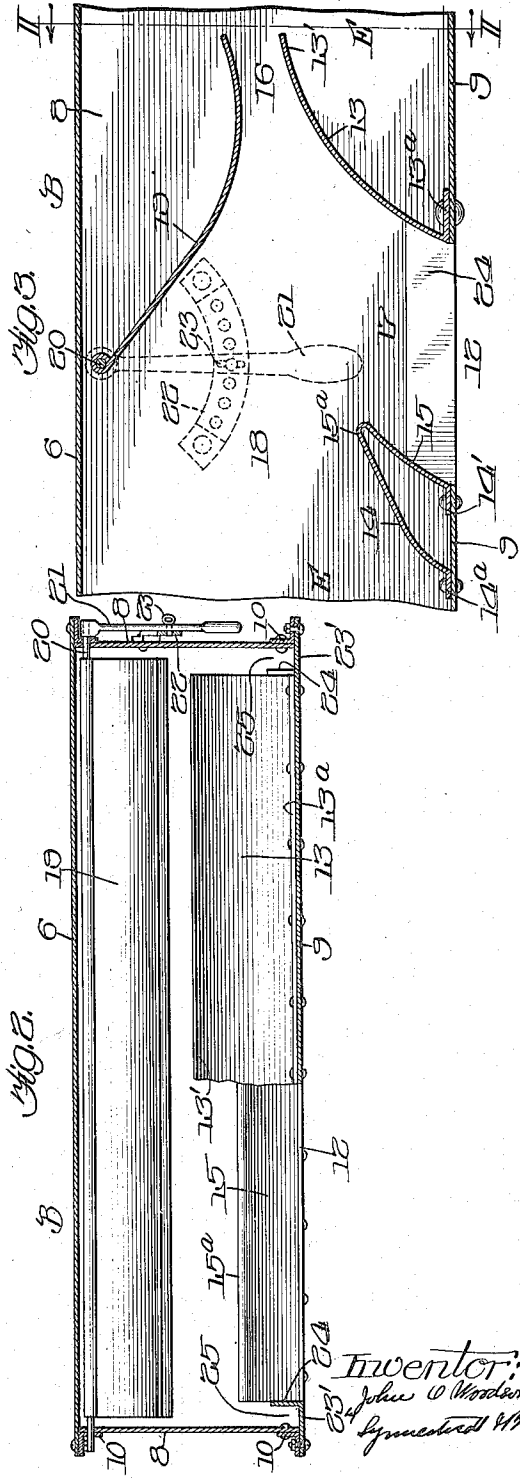
J. O. WOODSOME.
 SUCTION HOOD FOR DRYING MACHINES.
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UNITED STATES PATENT OFFICE.

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SUCTION-HOOD FOR DRYING-MACHINES.

1,129,155.

Specification of Letters Patent. Patented Feb. 23, 1915.

Application filed October 20, 1913. Serial No. 796,163.

To all whom it may concern:

Be it known that I, JOHN O. WOODSOME, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Suction-Hoods for Drying-Machines, of which the following is a full, clear, and exact description.

This invention relates generally to improvements in drying machines, and has reference more particularly to a novel suction hood for use in connection with a machine adapted for drying wet paper stock, or the like.

It is customary in the art of drying paper, or the like, to pass the wet stock or web over steam heated rolls in order to drive out the moisture from the stock as it progresses rearwardly through the machine. The web during this operation gives off large volumes of vapor and steam, which not only fills the room to the discomfort of the operatives, but also retards the drying operation to a considerable extent as the web partially reabsorbs the moisture contained in the vapor and steam thus given off. This condition is further productive of an uneven drying out of the paper, which frequently results in breakage of the web and consequent delay to the drying operation.

The purpose of this invention is to overcome these defects, by the provision of an improved suction hood disposed to overhang the heated rolls forming the drying machine, and adapted to withdraw the steam and vapor given off by the web in an efficient and expeditious manner.

Another object of my invention is the provision of adjustable means in a suction hood adapted to control and regulate the flow of vapor and steam throughout the entire length of the hood, or accelerate or diminish the flow at points accordingly as the situation may require.

My invention also contemplates certain novel details of construction, combination and arrangement of parts of the improved device, whereby certain advantages are at-

tained as will be more fully described hereinafter, and pointed out in the claims. 50

The foregoing, together with such other objects as may hereinafter appear, or are incident to my invention, I attain by means of a construction which is illustrated in preferred form in the accompanying drawings, wherein: 55

Figure 1 is a diagrammatic view taken centrally and longitudinally through my improved suction hood, and showing its relation to the paper heating rolls over which it overhangs. 60

Figure 2 represents an enlarged transverse section through the hood along the line II—II; and

Figure 3 is an enlarged detailed view of a portion of the hood shown in Figure 1. 65

Referring to the drawings, the letter A indicates a series of heating rolls, arranged diagonally in a plurality of rows, as is customary in machines of this class. The paper stock, generally speaking, is at its wettest stage as it initially enters the rolls at the "wet" end, which in this case is at the right of Figure 1, and gradually parts with its contained moisture as it passes over and between the rolls, until it emerges at the rear or "dry" end as a dried product. 70 75

In carrying out my invention, the suction hood B is disposed to overhang the series of rolls A, or such portion of the entire series as may be desired. The hood is preferably rectangular in cross section, and its front end 4, immediately above the initial rolls or wet end of the machine, is connected with any suitable suction creating device as C, and tapers gradually therefrom in the vertical direction to the outer front end 5 which overhangs the dry end of the machine. 80 85

The hood is preferably of box-like conformation and comprises the top plate 6, end plates 7, 7, side plates 8, 8 and bottom plate 9, fastened together in any suitable manner, or as in the manner shown in Figure 2 where angle irons 10 are used to connect the side plates with the top and bottom plates, the latter being detachably connected 90 95

to the horizontal leg of the angle iron. This arrangement is advantageous in that the parts comprising the hood may be readily assembled, and as readily taken apart whenever desired.

As the wet web in passing through the machine comes into contact with the heated rolls, it gives off a large amount of steam and vapor, particularly at the wet end, which saturates the air in the immediate vicinity of the machine, and rises to create a foggy condition in the drying room. Part of the moisture driven off by the rolls is reabsorbed into the web, particularly as it passes through the vapor pockets, indicated as at 11, where this situation is aggravated to some extent by the slow rising of vapor therefrom.

My invention is designed particularly to relieve this situation, and with this end in view, I provide intake ports or slots 12 in the bottom plate 9 extending substantially from side plate to side plate, and at intervals longitudinally of the hood. Preferably the intake ports 12 are disposed directly over the vapor pockets 11 between the upper series of rolls to accelerate the abstraction of vapor therefrom, which is induced to flow through the main passage D of the hood by the action of the suction device C.

One of the principal features of this invention is the provision of means for controlling the induced flow of vapor and steam through the passage D, and with this end in view I provide at that side of the intake ports 12 nearest the suction creating device C, an arcuate deflecting member 13, which extends transversely within the hood, the lower end of which is secured at 13^a to the bottom plate 9 in close proximity to the port, and inclines upwardly therefrom a short distance in a direction away from the port and toward C, terminating with its upper end 13' substantially midway between the top and bottom plates to form the throat 16 of the suction hood.

At the other side of the port is provided an arcuate deflecting member 14 having one end 14^a fastened to the bottom plate, and bent back upon itself at 15^a for attachment at its other end 14' to the bottom plate adjacent the edge of the port. In this manner I provide the guide member 15 which projects partly over the port, and is designed to cooperate with the deflector 13 in defining the intake passage 17 leading from the port. The direction of inclination of deflector 14 and guide member 15 is in agreement substantially with that of the member 13, terminating at 15^a in a plane below that of the upper end 13' of the deflector 13, and with the top plate acting to restrict the area of the passage D at 18.

As a means for controlling the flow of vapor from the main passage D and intake passage 16 through the throat 16 I provide a damper 19 which is pivotally carried on a spindle 20 having bearings in the side plates adjacent the top plate. The damper which has its pivoted end disposed centrally above the passage 17, also inclines toward the exhaust end of the hood and terminates substantially in the same vertical plane as does the deflector end 13'. In order to manipulate the damper, which is provided to restrict or increase the area of vapor flow through the throat 16, a lever 21 is mounted on one end of the spindle 20 to depend therefrom, relative positioning of the lever and damper being obtained by any suitable means, such as the sector 22 mounted on the side plate and perforated to receive the pin 23 which passes through a hole provided in the arm of the lever for the purpose.

From the foregoing, it will be apparent that the dampers 19 are each capable of adjustment to suit the varying conditions in the drying machine, and are adapted to effectually control a situation where a larger amount of vapor and steam is given off at the wet end than at the dry end. Restricting or increasing the area of flow at the throat of the hood by manipulating the dampers determines the degree and rate of flow through the hood, which is always under complete control of the operator.

This flow of vapor may be increased or decreased at points throughout the hood as occasion requires, as for example, an increase of throat area at the end 5 of the hood over that at the end 4 tends to neutralize the stronger suction action at the wet end 4, which has to take care of the greater percentage of vapor, as will be readily understood.

In the operation of the device, the vapor entering one of the ports 12 is induced to flow through the passage, the flow being increased by the suction action at the throat 16. As previously stated the area of flow at the throat may be varied as occasion may warrant, by manipulating the damper 19 in the manner already set forth. In its passage toward the suction device C, the vapor expands in each of the chambers E, formed between adjacent throats, to reduce the velocity at these points from its velocity of flow at the throats, so as to get away from frictional losses. Before reaching each successive throat, the vapor is deflected in a direction theretoward by the deflector member 14, which further acts to restrict the main passage at 18, whereby the vapor has an impinging effect on the vapor entering the succeeding passage 17. The vapor, on its passage through the expansion chambers E, parts with some of its contained moisture, and for

this reason the members 13, 14, 15, preferably do not extend to the side plates, but stop short thereof to provide a clearance or clearances at the sides of the hood. In order that a line of drainage be afforded throughout the hood a portion of the bottom plate web at 23 is left at one or both sides of the intake port, and I provide an inner side member or members 24 carried by the members 13 and 15, which projects upwardly from the web 23 to form a trough 25 extending between adjacent sections of the main passage D. The water is carried along to some extent by the suction, and may be drawn off from the hood in any suitable manner.

From the foregoing, the essential features, elements, and operation of the device, together with its simplicity and other advantages thereof, will be clearly apparent to those skilled in the art.

Having thus described my invention and illustrated its use, what I claim as new and desire to secure by Letters Patent, is the following:—

1. A vapor suction hood for drying machines or the like, comprising a box-like frame providing a main passage for the flow of the vapor therethrough, said frame including as a member thereof a bottom plate having an intake port communicating with the main passage, and means disposed in the main passage adjacent the intake port for throttling the flow of vapor through the hood.

2. In combination, a suction hood having a main passage for conducting vapor to its discharge end and provided with an intake port adapted to communicate with said main passage, and variable means located in the main passage for throttling the flow of vapor in its passage through the main passage, substantially as described.

3. In combination, a suction hood having a main passage for conducting vapor and provided with an intake port adapted to communicate with said main passage, and adjustable governing means located adjacent said intake port for throttling the flow of vapor in its passage through the said main passage.

4. In combination a suction hood having a main passage for conducting vapor, and provided with an intake passage communicating with the main passage, the said intake passage being defined by deflecting members arranged in the main passage and restricting the latter, and means cooperating therewith to further restrict the said main passage.

5. A suction hood comprising in combination an inclosed box-like frame constituting a main passage for conducting vapor and having its wall perforated at intervals to provide a series of intake ports, a deflecting

member adjacent the ports and mounted in the main passage to restrict the area of vapor flow therethrough and define the suction throat, and a damper movably mounted in the frame for cooperative relation with the said deflecting member.

6. A suction hood comprising in combination an inclosed box-like frame constituting a main passage for conducting vapor and having its wall perforated at intervals to provide a series of intake ports, deflecting members for the ports and mounted in the main passage to restrict the area of vapor flow therethrough, and means mounted in the frame for correlative movement with respect to the said deflecting members.

7. In a paper drying machine, the combination with drying rolls over which the paper stock is passed, thereby forming a series of vapor pockets between the rolls, a suction hood mounted to overhang the machine and provided with a series of intake ports formed in its lower wall and disposed above the pockets, the said hood constituting a main passage for conducting therethrough the flow of vapor entering the ports, and means located in the main passage for controlling the flow of the vapor.

8. In combination, a suction hood having an intake opening in its wall, an expansion chamber disposed adjacent each side of the said opening, and a water conducting trough between the chambers and bridging the intake opening.

9. In combination, a vapor conducting suction hood having an intake port formed in its wall, and means defining an expansion chamber disposed to one side of said port, said means being adapted to restrict the area of flow into said expansion chamber, substantially as described.

10. In combination, a vapor conducting hood having a main passage and an intake port, and cooperating members adjacent said intake port for restricting the flow of vapor, one of said members being movable relative the other to vary the flow through the said passage, substantially as described.

11. In combination, a suction hood of box-like shape providing a passage for the conduction of vapor therethrough, said hood having its bottom plate ported to provide an intake opening, and a throttling member carried by said hood and projecting into the passage to restrict the flow of vapor through said passage.

12. A vapor conducting suction hood constructed to form a main passage inclining toward the suction end of the hood and provided with a vapor intake port in its wall opening into said passage, and a throttling means positioned in the passage and extending in a direction toward the said suction end.

13. A vapor suction hood having a discharge outlet and an intake port, throttling means located in the hood at the outlet side of the port and normally spaced to form the throat of the hood, and a deflector positioned with reference to said means for deflecting the vapor toward said throat.

In testimony whereof I have hereunto signed my name in the presence of the two subscribed witnesses.

JOHN O. WOODSOME.

Witnesses:

W. HERBERT FOWKES,
U. H. GROENLUND.