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 HS, 55.5, 56, 112; 28/62

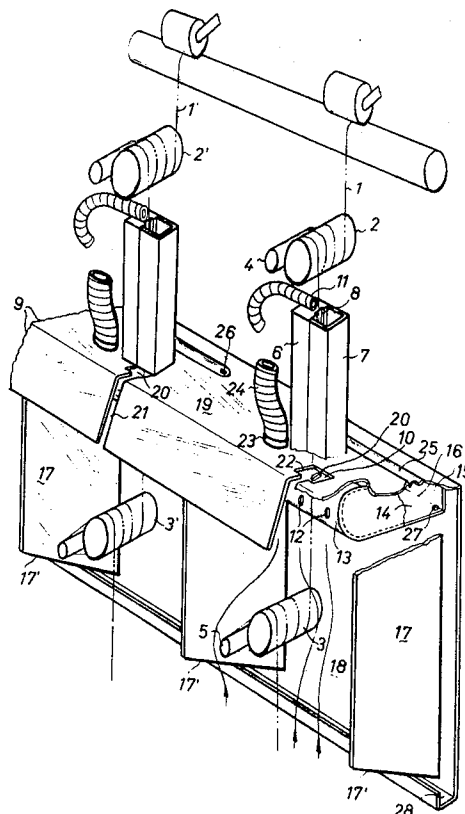
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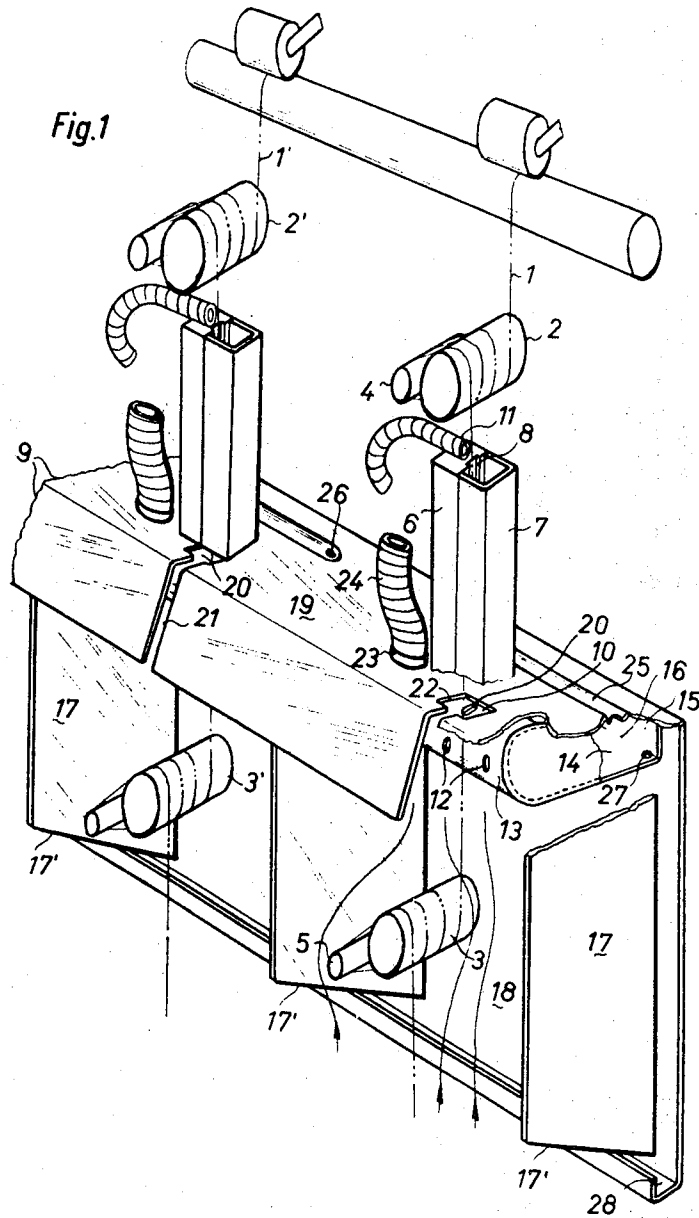
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[54] **APPARATUS FOR ELIMINATING VAPOR AND
 CONDENSATE FROM DRAWING
 ARRANGEMENTS**
18 Claims, 2 Drawing Figs.

[52] U.S. Cl..... **57/55.5,**
57/34 HS
 [51] Int. Cl..... **D02j 13/00,**
D01h 5/00

ABSTRACT: The suction hood is mounted to receive condensate from the bloc heater either indirectly via the rooflike cover (FIG. 1) or directly (FIG. 2). The received condensate leaves the suction hood via drain openings adjacent the backwall so as to flow downwardly without contacting the draw rolls. The vapor is eliminated by suction from above and below the block heater via the tubes and hood.

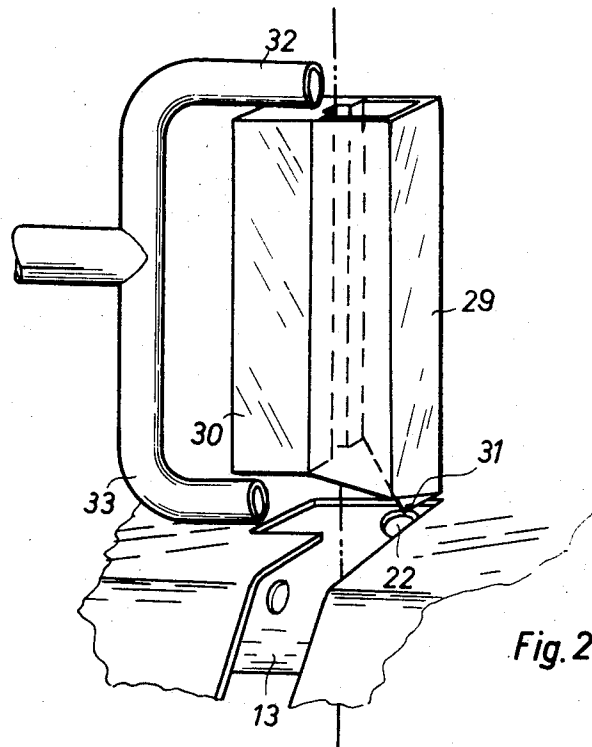




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APPARATUS FOR ELIMINATING VAPOR AND CONDENSATE FROM DRAWING ARRANGEMENTS

This invention relates to an apparatus for eliminating vapors and condensate from a drawing arrangement as used on draw-twisting and draw-winding machines.

Heretofore, drawing devices for endless threads have been known to use an arrangement of heated rolls and/or block heaters between two thread-transporting rolls in a closed housing in order to process the thread. The thread which has been processed in such an arrangement has entered and exited from the housing via openings such as gates or slots. Since vapors have been formed while the thread has been heated, due to various preparations previously applied to the thread, suction has been applied to the housing to draw off the vapor.

These closed housings, however, have had a disadvantage in that the housings must be constructed in two parts and must be opened by lifting one part for threading in of the thread. This not only complicates operation of the machine, but furthermore requires more expensive equipment without achieving a solution of the task of condensate elimination.

Accordingly, it is an object of the invention to eliminate vapor and condensate from drawing arrangements.

It is another object of the invention to eliminate vapor and condensate simply and inexpensively from drawing arrangements.

It is another object of the invention to draw off condensate from a drawing arrangement in a simple manner.

Briefly, the invention provides an apparatus which utilizes the elements provided for vapor suction for the elimination of condensate from a drawing arrangement. The apparatus is used in an arrangement having a block heater, a cover over the heater to define an enclosure, a heated draw roll below the block heater and cover, and means for placing the enclosure under suction. The apparatus includes a means forming a chimneylike compartment between the block heater and draw roll, a cover at the upper end of the compartment and a suction hood suspended from the underside of the cover. The hood is placed under suction and is exposed to the enclosure of the covered block heater to draw off vapor from the enclosure. In addition, the cover and hood are shaped to take up condensate dripping from the block heater and to guide the condensate to a backwall of the chimneylike compartment. In this way by causing the condensate to flow down the backwall the condensate avoids the sides of the draw roll.

In one embodiment, the condensate from the block heater is allowed to drip onto the cover and flow down to a collector groove at a lower end. This collector groove, in turn, communicates through a suitable drain opening with the interior of the hood so that the condensate can be drawn off through the hood.

In another embodiment, the condensate from the block heater is allowed to drip directly into the hood in order to be drawn off. This embodiment eliminates the need for a collector groove and drain opening in the cover.

These and other objects and advantages of the invention will become more apparent from the following detailed description and appended claims taken in conjunction with the accompanying drawings in which:

FIG. 1 illustrates an axonometric view of a drawing arrangement provided with an apparatus according to the invention; and

FIG. 2 illustrates an axonometric view of a block heater cover according to the invention.

Referring to FIG. 1, the drawing arrangement for endless threads, also called filaments, consists of two draw rolls 2, 3 and a separator roll 4, 5 adjacent each draw roll 2, 3 as well as a block heater 6 covered by a cover 7 and provided with a heating surface 8 on which the threads contactingly pass. An identical drawing arrangement with draw rolls 2', 3' is placed to the right (not shown).

In order to eliminate vapor and condensate, a roof-shaped cover 9 which extends along the length of the machine is positioned below the block heater 6 and has an inclined portion 19 sloped downwardly towards the back. In addition, a suction

hood 13 is suspended from under the cover 9 and includes holes 12 in the front, a lower wall 14 which is slightly inclined towards the back and an upstanding backwall 15. The front wall, lower wall 14 and backwall 15 together form a channel. A vertical separator wall 17 is provided between neighboring lower draw rolls, e.g., 3 and 3' in order to form a chimneylike compartment together with the cover 9 and a backwall 18. Each compartment serves to direct an airflow upwards in the direction indicated by the arrows. The lower edges 17' of the separator walls 17 are inclined downwards towards the backwalls 18 so that condensate collected on the walls 17 is guided to the backwall 18.

The inclined portion 19 of the cover 9 is provided with suction openings 20 each of which is formed by an enlargement at the back of a threading-in slot 21 while each hood 13 is provided with an opening 22 so that the suction of the suction hood 13 is caused to act on the lower part of each block heater 6. Each suction hood 13 ends at the separator walls 17 and is provided with a suction nozzle 23 which is connected to a central suction source (not shown) by means of a hose 24. In addition, the suction source also provides a vacuum for an upper suction device 11 of the block heater 6. In this manner, the drawing arrangement is exposed to an airstream of low velocity at the locations where vapors form on the threads. This airstream is generated below the heated draw rolls 3 owing to the natural chimney effect in the compartment between the walls 17, 18 and is drawn off above the heated draw rolls 2.

In order to remove the condensate, any condensate which forms in the hose 24 at the beginning of an operation due to cooling flows back to the hood 13. Also, the cover 9 is provided with collector grooves 25 at the back in order to take up condensate dripping from the block heater cover 7 onto the inclined portion 19. Each groove 25 connects via a drain opening 26 with the suction hood 13 therebelow. The groove 16 in the hood 13 then takes up the condensate entering via the openings 26. This groove 16 as well could be replaced by a slot (not shown). The suction hood 13 is further provided with condensate drain openings 27 arranged near the back end in the neighborhood of each separator wall 17, so that condensate can flow out of the hood 13 down the backwall 18 while avoiding the sides of the draw roll 3. The condensate is then collected in a collector groove 28 formed by the lower end of the backwall 18 and flows into a central collector vessel (not shown).

Referring to FIG. 2, the cover 29 of the block heater 30 can be constructed to have a point 31 from which condensate can drip directly into the suction opening 22 of the suction hood 13, the point 31 being vertically above the opening 22. In this alternative construction, a collector groove and condensate drain openings in the cover are not needed. Furthermore, the suction device for the block heater 30 can be provided with an upper suction nozzle 32 for the upper end of the heater 30 and a branch suction tube 33 for the lower end of the block heater 30.

The invention thus provides an apparatus which by combining vapor and condensate elimination, achieves a vapor elimination under minimum suction air quantities while the condensate is guided into a central collector vessel without provision of additional ducts; use being made of only the elements provided for vapor suction.

What is claimed is:

1. An apparatus for eliminating vapor and condensate from a drawing arrangement for endless threads having a block heater, a first cover over said heater and a draw roll below said heater; said apparatus comprising

means defining a chimneylike compartment between said heater and draw roll, said means including a second cover at the upper end of said compartment below said heater and a vertical backwall extending below said draw roll; and

a suction hood suspended below said second cover, said hood communicating with said heater to receive conden-

sate dripping from said heater and communicating with said backwall to guide the received condensate to said backwall for flowing past said draw roll.

2. An apparatus as set forth in claim 1 wherein said first cover includes a lowermost point for dripping of condensate therefrom into said hood.

3. An apparatus as set forth in claim 1 which further comprises a plurality of said heaters and draw rolls, and a corresponding plurality of said compartments having a separate suction hood therein.

4. An apparatus as set forth in claim 1 wherein said suction hood has a condensate collector groove therein extending longitudinally thereof.

5. An apparatus as set forth in claim 4 wherein said collector groove is provided at said backwall.

6. An apparatus as set forth in claim 4 wherein said condensate collector groove is provided with condensate drain openings arranged near said backwall and laterally offset from said draw roll.

7. An apparatus as set forth in claim 1 wherein said backwall forms a condensate collector groove below said draw roll.

8. An apparatus as set forth in claim 1 wherein said suction hood has a suction opening directed upwardly and arranged vertically below an opening in said second cover and below said block heater.

9. An apparatus as set forth in claim 8 wherein said block heater has a point arranged vertically above said suction opening of said suction hood for dripping of condensate directly into said suction hood.

10. An apparatus as set forth in claim 1 wherein said suction hood has suction openings communicating with the lower end of said heater.

11. An apparatus as set forth in claim 1 wherein said means includes a pair of separator walls extending from said backwall.

12. An apparatus as set forth in claim 11 wherein each separator wall has a lower edge inclined downwardly towards said backwall to direct condensate thereto.

13. An apparatus as set forth in claim 1 wherein said second cover is inclined downwardly towards said backwall and includes a groove therein and drain openings in said groove communicating with said hood.

14. An apparatus as set forth in claim 1 wherein said second cover is inclined downwardly towards said backwall and said heater has a point for dripping of condensate therefrom onto said second cover.

15. An apparatus as set forth in claim 1 wherein said suction hood has a suction duct extending upwardly for connection to a suction source.

16. An apparatus as set forth in claim 1 wherein said second cover is roof shaped.

17. An apparatus as set forth in claim 16 wherein said second cover has a condensate drain opening arranged on one side thereof.

18. An apparatus as set forth in claim 1 which further includes a suction means at the upper end of said heater and a suction means at the lower end of said heater.

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UNITED STATES PATENT OFFICE
CERTIFICATE OF CORRECTION

Patent No. 3,633,353 Dated January 11, 1972

Inventor(s) Arthur Wurml

It is certified that error appears in the above-identified patent
and that said Letters Patent are hereby corrected as shown below:

Column 1, line 71, insert "to the left and" after
--placed--

Signed and sealed this 30th day of May 1972.

(SEAL)
Attest:

EDWARD M. FLETCHER, JR.
Attesting Officer

ROBERT GOTTSCHALK
Commissioner of Patents