

[72] Inventors **Ralph P. Mahoney;**  
**Irvin J. Phillips, Beloit, Wis.**  
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 [73] Assignee **Beloit Corporation**  
**Beloit, Wis.**  
**a corporation of Delaware**  
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**3,397,673.**

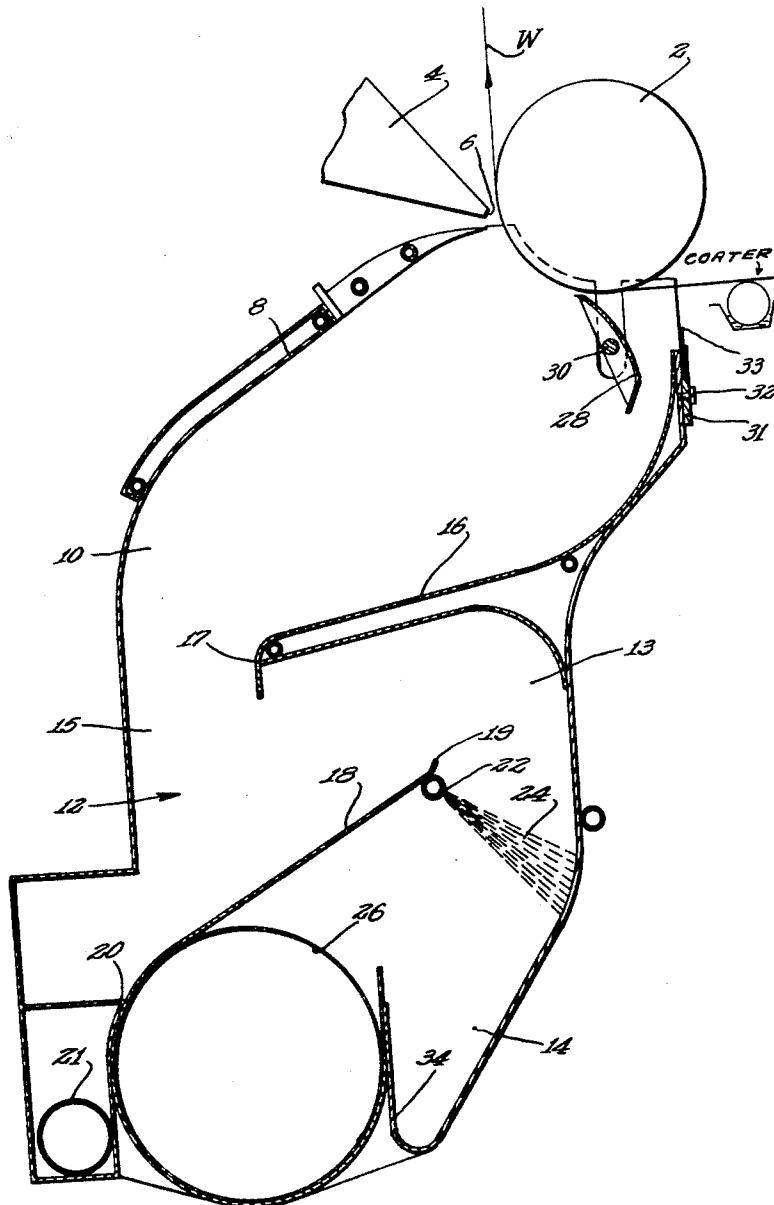
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Primary Examiner—John P. McIntosh  
 Attorney—Hill, Sherman, Meroni, Gross & Simpson

[54] **AIR KNIFE COATING PAN**  
**3 Claims, 1 Drawing Fig.**

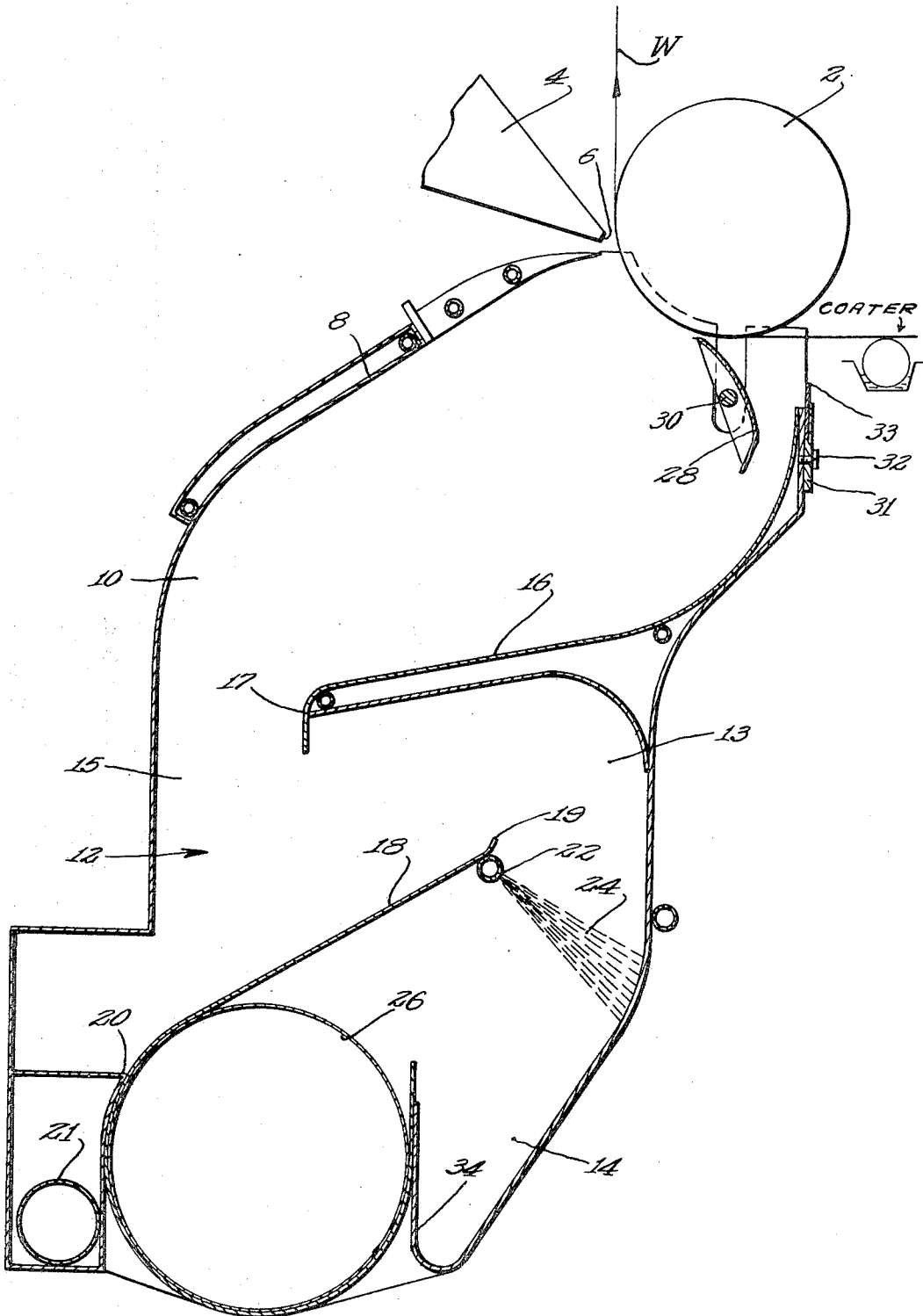
[52] U.S. Cl..... **118/63**  
 [51] Int. Cl..... **B05c 11/06**  
 [50] Field of Search..... **118/63,**  
**(Hood Digest); 15/306.1; 55/248, 1**

**ABSTRACT:** A coating mechanism for coating a traveling web wherein a layer of coating is applied to the web and an air knife smooths the coating. The mechanism is provided with a plurality of baffled chambers with an upper baffle, an interior baffle plate beneath a backing roll and a lower baffle which slopes downwardly so as to be free of any pool of liquid on its upper surface.



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INVENTORS

Ralph P. Mahoney

Irvin J. Phillips

ATTORNEYS

BY *Will Sherman, Miami, Fla.*

## AIR KNIFE COATING PAN

This application is a continuation-in-part of our application, U.S. Ser. No. 527,248 filed Feb. 14, 1966, now U.S. Pat. No. 3,397,673.

## BACKGROUND OF THE INVENTION

While the principles of the invention may, in certain circumstances be employed in coating various web materials, the features are particularly well adapted to use in coating a traveling paper web and the preferred embodiment will be described in connection with this environment. In air knife coating, a layer of coating is first applied to a traveling web and the web is supported on a backing roll with a curtain of relatively high velocity air directed against the oncoming web to smooth the coating surface and in some instances to doctor off excess coating. The velocity of air emitted from the air knife that is necessary for satisfactory doctoring process, and the speed of the oncoming web, tend to create a mist of particles of coating entrained in the flow of air which deflects off the web. This becomes particularly true at increased web travel speeds and with paper machine advancements and improvements that have been the necessity for increased production, higher web travel speeds become essential. The resultant mist reaches a stage so as to become prohibitive and tends to deposit in particles on the smooth coated web beyond the air knife and on surrounding machinery. The particles of mist tend to become partially dried in the air and when becoming deposited on the coated web, cause imperfections thereon. The mist contaminates the surrounding air, is annoying and disadvantageous to personnel and damaging to machine parts.

It is an object of the present invention to provide an improved air knife coater embodying apparatus for substantially reducing the undesirable mist created by the air knife.

A further object of the invention is to provide means for collecting mist caused by an air knife coater so that the mist is more effectively removed from the air.

A still further object of the invention is to provide a pan arrangement beneath an air knife coater conducting mist laden air in a path in such a manner that the separation of the mist from the air is substantially improved.

Other advantages, features and objects of the invention will become more apparent by the teaching of the principles of the invention in connection with the disclosures of the preferred embodiments thereof in the specification, claims, and drawings, in which:

## DRAWINGS

The single FIG. of the drawings illustrates a side elevational view of a coating mechanism with portions broken away to particularly show the internal structure and the path of travel of the mist laden air.

## DESCRIPTION OF THE PREFERRED EMBODIMENT

A backing roll 2 is driven in rotation and carries on its surface a traveling paper web W. Coating is applied in the lower surface of the web by mechanism not shown, and this coating is smoothed by an air knife 4, having an air emission tip or nozzle 6.

The air engages the liquid coating on the surface of the web W and is deflected downwardly, carrying with it mist or particles of coating which are formed by the airstream.

For catching the mist laden air and removing the mist from the air, a housing assembly 8 is provided beneath the roll 2. The mist is removed from the air both for purifying the air and for reclaiming coating, although in some circumstances the reclaimed coating may be discarded.

The mist passes downwardly into a first compartment 10 and then over a first baffle 16 and into a second compartment 12. The first baffle 16 is arranged so as to slope downwardly and keep clear of liquid coating on its upper surface, and coating which forms on its surface will run downwardly over the outer free edge 17 of the first baffle 16. The air and mist in passing from the first chamber 10 to the second chamber 12

pass through a passage 15 formed at the outer edge 17 and the baffle 16.

The lower second chamber 12 is divided into an upper compartment 13 and a lower compartment 14 by a second baffle 18. Air and mist passing from the first compartment 13 to the second compartment 14 pass over the upper outer edge 19 of the second baffle 18. At that location is positioned a liquid jet 22 emitting a jet of mist-collecting liquid 24 which runs downwardly into a save-all pan 34 at the base of the second portion of the second compartment.

By the time the air has passed down through the path from the first chamber 10 to the second chamber 12 and through the liquid stream 24, it will be relatively clear of mist particles and can flow out of the end of the housing 8 through an air discharge opening 26.

The second baffle is advantageously constructed having an upper relatively flat planar surface which is inclined downwardly so that any condensed mist collecting on its surface will immediately flow downwardly and to the left as shown in the drawing. Also, any condensed mist which forms on the upper surface of the first baffle 16 will drop over its edge 17 onto the second baffle 18. The liquid that runs off of the baffle 18 onto its lower edge 20 is removed through a liquid opening 21.

As the mist laden air first enters the upper chamber, it flows past an inner baffle 28. This inner baffle has a curved upper surface, curved about an arc having a radius parallel to the roll 2. The inner baffle 28 is mounted on a pivot support 30 so as to pivot about a location parallel to the roll 2.

A front wall of the housing 8 is arranged as to be adjustable. This wall 31 is held in place by an adjustment attachment 32. Its upper edge 33 is in close running proximity to the web W. The plate 31 is adjusted so that its upper edge 33 is close to the web W, but so that it will not permit the escape of mist into the surrounding atmosphere. This arrangement permits a wide latitude in approach angles of the oncoming web. In many cases this angle will be changed and in order to maintain the housing as a relatively tightly closed unit, the wall 31 is vertically adjusted.

Thus it will be seen that we have provided an improved mist-collecting save-all arrangement for an air knife coater which meets the objectives and advantages above set forth. The structure is simple and reliable and advantageous over the prior art structures heretofore used. It employs baffles with upper surfaces not having pools of liquid and employs an improvement in flow path of the air.

The drawings and specification present a detailed disclosure of the preferred embodiments of the invention, and it is to be understood that the invention is not limited to the specific forms disclosed, but covers all modifications, changes and alternative constructions and methods falling within the scope of the principles taught by the invention.

We claim:

1. An air knife coater for coating a traveling web, comprising in combination:

a backing roll for carrying a traveling web;

means applying coating to the surface of the web;

an air knife positioned on the up-running side of the roll directing a flow of smoothing air against the oncoming surface of the web in a doctoring zone;

means defining a first chamber below said doctoring zone receiving air and mist flowing downwardly;

means defining a second chamber below the first receiving air and mist from the first chamber;

a baffle having an edge and projecting between said chambers with a passage at the edge providing communication between said chambers;

a second baffle projecting into said second chamber dividing the second chamber into upper compartment and a lower compartment with the upper surface of the second baffle inclined downwardly to a lower baffle edge and with a mist and air passage at the upper edge of the baffle;

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drain means at the lower edge of the second baffle removing condensed mist and keeping the upper surface free of liquid means withdrawing air from said second compartment;  
a baffle plate extending parallel to said backing roll at the top of said first chamber, said baffle plate having an upper arcuate surface adjacent said backing roll and the curvature of the surface extending about a radius line parallel to said backing roll; and  
adjustable mounting means for pivotally tilting said baffle

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plate about an axis parallel to said roll.

2. An air knife coater for coating a traveling web in accordance with claim 1 and including in combination a spray between said upper and lower compartment penetrating air and mist passing into said lower compartment.

3. An air knife coater for coating a traveling web in accordance with claim 1 including a condensate save-all pan at the base of the lower portion of the second compartment.

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