

United States Patent

Overly et al.

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[54] WEB STABILIZER

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[51] Int. Cl.: F26b 13/00

[58] Field of Search: 34/160, 156; 226/97

[56] References Cited

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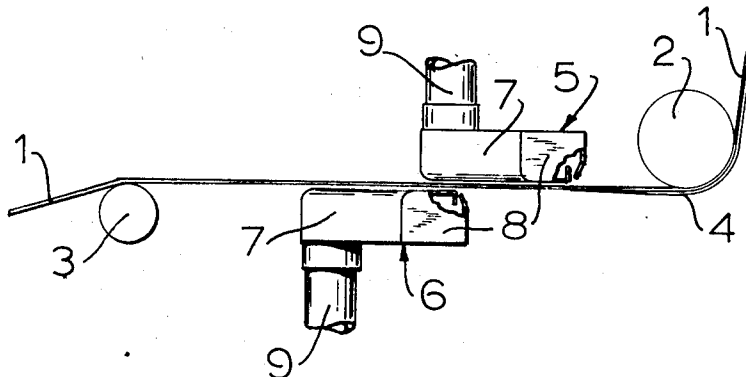
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[57]

ABSTRACT

An air foil web stabilizer is constructed with its opposite ends disposed generally at a slight angle to provide a lateral component to the air discharge in the general direction of web movement to thereby remove wrinkles from the web.

6 Claims, 5 Drawing Figures



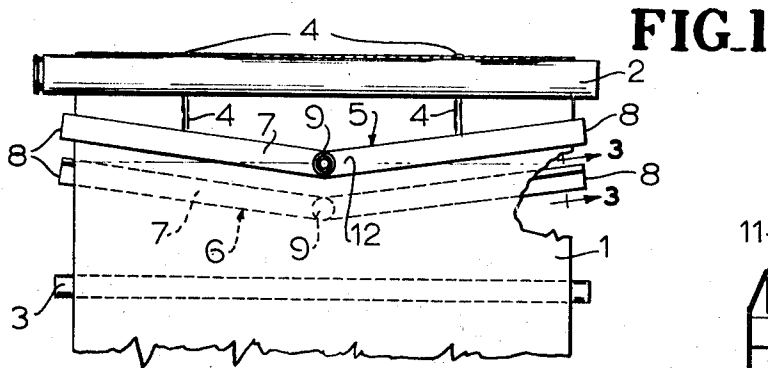


FIG. 1

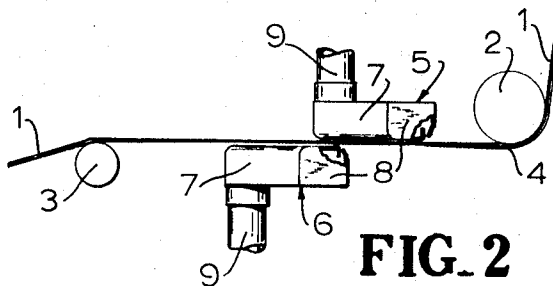


FIG. 2

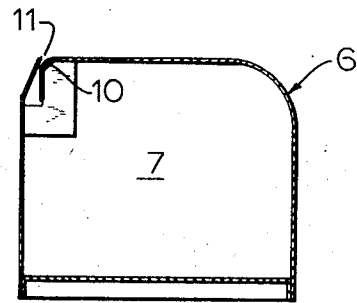


FIG. 3

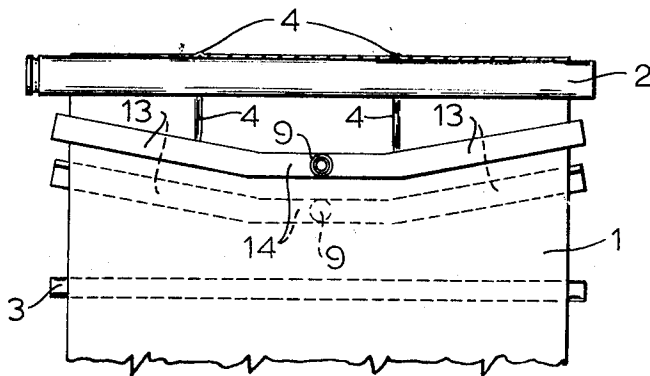


FIG. 4

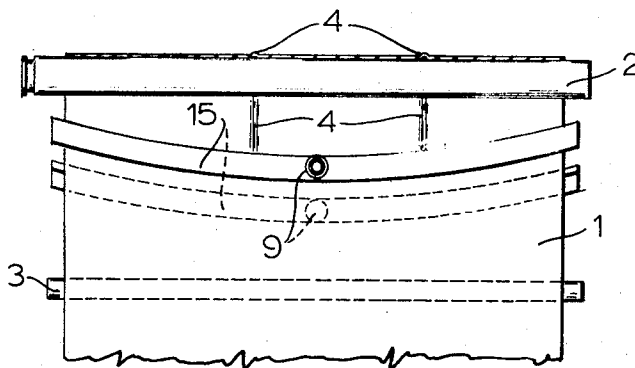


FIG. 5

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WEB STABILIZER

CROSS REFERENCE TO RELATED APPLICATION

This invention utilizes an air foil web stabilizer of the general type illustrated in application Ser. No. 817,834, filed Apr. 21, 1969 by the present inventors and which has now become U.S. Pat. No. 3,587,177 issued June 28, 1971.

BACKGROUND OF THE INVENTION

The present invention provides an effective wrinkle remover usable without direct contact with the web, wherever there is any tendency for a moving web to wrinkle. In fact the device of the present invention may be employed wherever it is desired to prevent wrinkling of a moving web, as well as for removing wrinkles from a web.

One of the problems encountered in paper mills lies in the tendency of the web to wrinkle following its passage through the sizing press.

Heretofore, it has been the practice to employ a bowed roll to remove the wrinkles from the paper web as it comes from the sizing press.

Similar problems of wrinkling of webs arise at other stages of paper making and also in the printing and even in textile making and usage.

SUMMARY OF THE INVENTION

According to the present invention an air foil web stabilizer, which as previously constructed and employed extended straight across the web normal to the direction of web movement and with its discharge of air in either the direction of or against web movement, is constructed with its opposite end portions disposed at a slight trailer angle to give the air discharging forwardly therefrom a lateral component which tends to stress or stretch the web laterally and progressively as it moves forwardly.

The present invention eliminates the need for a bowed roll.

BRIEF DESCRIPTION OF THE DRAWING

The accompanying drawing illustrates the best mode presently contemplated by the inventor for carrying out the invention.

In the drawings:

FIG. 1 is a plan view illustrating employment of the invention in a part of a paper machine;

FIG. 2 is a side elevation of the apparatus illustrated in FIG. 1 with parts broken away and sectioned;

FIG. 3 is a detail section of the air foil construction taken on line 3—3 of FIG. 1;

FIG. 4 illustrates a variation in construction of the stabilizer; and

FIG. 5 illustrates another variation in the stabilizer construction.

DESCRIPTION OF THE PREFERRED EMBODIMENT

The invention is illustrated as applied to a web of paper 1 leaving the sizing press turning roll 2 and passing over a second roll 3 in its course through a paper machine. Notice that numerous wrinkles or waves 4 appear in the web 1 as it leaves the turning roll 2.

In applying the invention an air foil stabilizer 5 is disposed transversely above the web and a second air foil stabilizer 6 is disposed transversely below the web as shown in Fig. 1.

The air foil stabilizers 5 and 6 are of the construction generally illustrated and described in application Ser. No. 817,834, referred to above.

As illustrated in the drawing, each stabilizer 5 and 6 com-

prises a generally tubular plenum chamber 7 extending across the web 1 with closed ends 8 and with an air supply pipe 9 connected centrally thereto.

The surface of the plenum chamber 7 facing the web constitutes an air foil 10 which is supplied with air by a slot 11 on the trailing side of the chamber 7 just behind the curved air foil surface. The air follows the air foil surface 10 forwardly in between the plenum chamber 7 and the web 1 in the general direction of movement of the web as indicated by the arrows in FIGS. 1 and 2.

In carrying out the present invention, the plenum chamber 7, instead of being straight from end to end, has its opposite end portions angled approximately from 5°-10° from the center line 12 in a trailing direction relative to the direction of movement of the web.

As illustrated, the angular end portions of the plenum chamber 7 extend straight from each corresponding end to near the center where the supply pipe 9 connects with the plenum chamber and the plenum chamber points either in the direction of web movement or opposite thereto.

Note in FIG. 1 that the wrinkles or waves 4 in the web 1 disappear as the web leaves the region of the stabilizers 5 and 6.

The exact angle employed for the end portions of the plenum chamber may vary as shown in FIG. 4 where end portions 13 are disposed at a greater angle and are generally shorter, leaving a central portion 14 that is parallel to the center line normal to the direction of web movement.

A more expensive construction is illustrated in FIG. 5, where the plenum chamber 15 is curved from end to end with the ends gradually trailing from the center and simulating the effect of the earlier described angular constructions.

Various modes of carrying out the invention are contemplated as being within the scope of the following claims particularly pointing out and distinctly claiming the subject matter which is regarded as the invention.

We claim:

1. An air foil web stabilizer comprising a generally tubular plenum chamber extending transversely of a moving web with a longitudinally extending air discharge slot directed toward the web and an air foil surface including a curved portion to which said slot discharge is generally tangential and a substantially flat portion merging therewith and disposed generally in a plane parallel to and adjacent the web for controlling the flow of air along the surface of the web in the general direction parallel to web movement, characterized by having the end portions of the stabilizer angularly offset in a trailing direction of air flow in the general plane of the web to provide a lateral component of air direction generally stressing the web transversely thereof to avoid wrinkles in the web.

2. The construction of claim 1 in which the end portions of the stabilizer trail the center thereof in relation to the direction of movement of the web to provide an air flow in the general direction of web movement.

3. The construction of claim 1 employing two similar web stabilizers disposed on opposite sides of the web.

4. The construction of claim 1 in which the angularly disposed end portions of the stabilizer extend straight from the center to the corresponding opposite ends at an angle of approximately from 5°-10° from the longitudinal center line of the stabilizer.

5. The construction of claim 1 in which a central portion of the stabilizer extends normal to the direction of web movement and the end portions are disposed at a substantial angle therefrom.

6. The construction of claim 1 in which the stabilizer is generally curved from end to end in the general plane of the web.

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