

[54] FLUID CONTROL OF HEADBOX SLICE OPENING

2,928,464 3/1960 Western et al.....162/347

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[57] ABSTRACT

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[51] Int. Cl.....D21f 1/06

[58] Field of Search.....162/317, 214, 347, 344, 263, 162/354, 371

A control for the headbox slice opening of a papermaking machine in which the slice is position controlled by pneumatic means, such that the load upon the slice lips is transferred to a heavy frame member. Air blocks are mounted between the slice lip and the heavy frame member to allow precise position control of the slice lips.

[56] References Cited

UNITED STATES PATENTS

8 Claims, 2 Drawing Figures

3,562,106 2/1971 Beck et al.....162/347 X

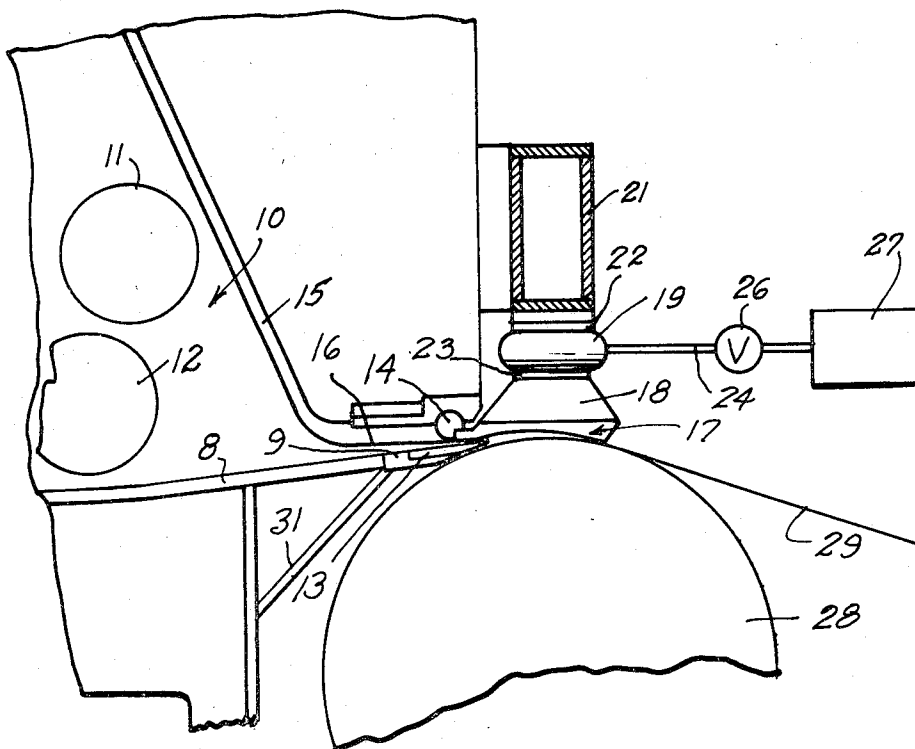


Fig. 1

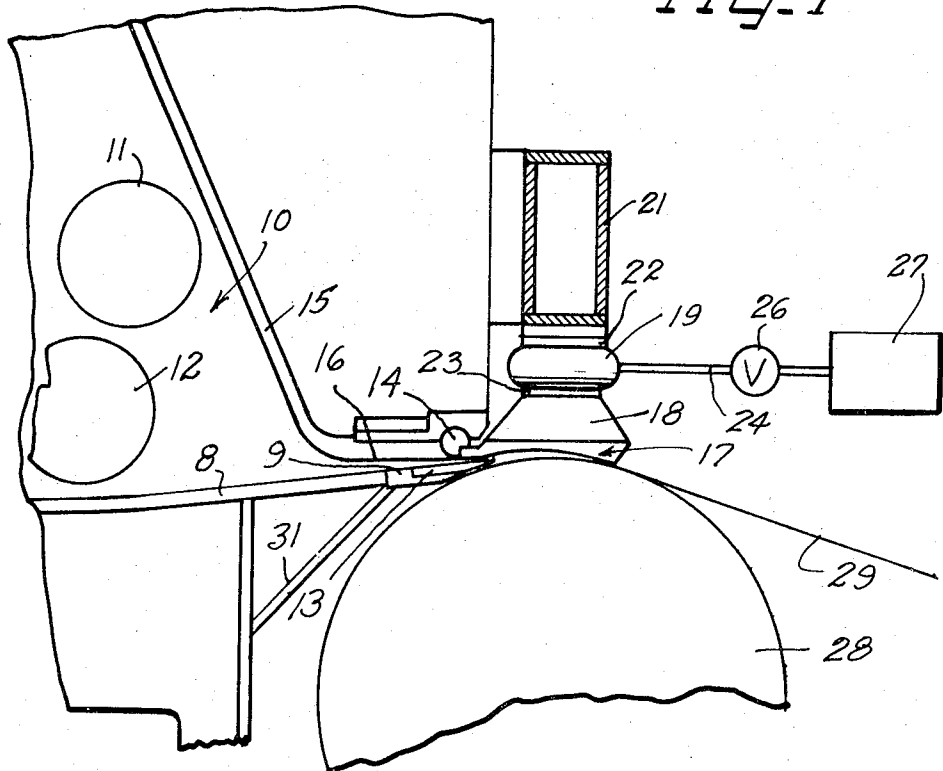
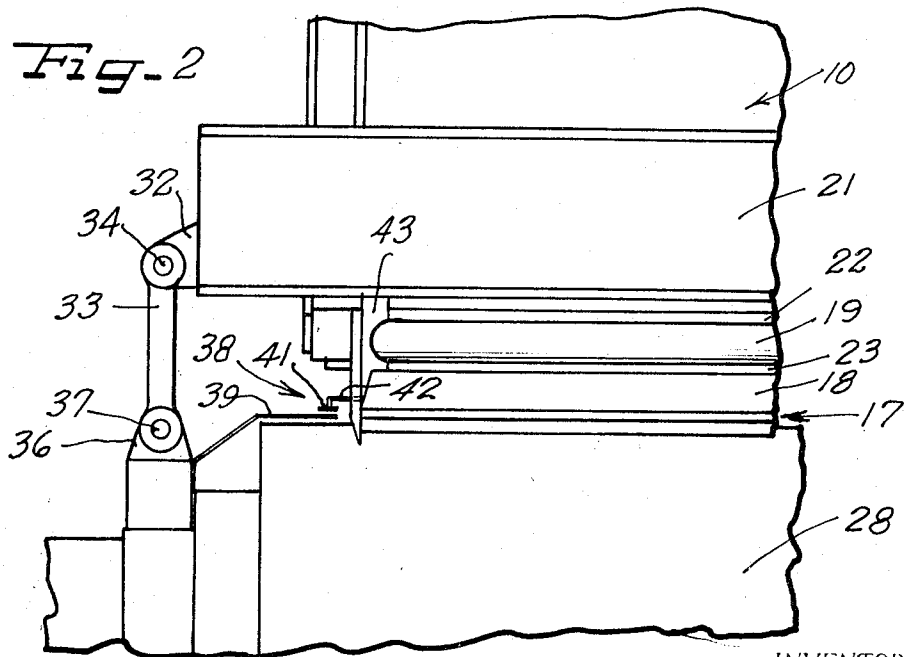


Fig. 2



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## FLUID CONTROL OF HEADBOX SLICE OPENING

### CROSS-REFERENCES TO RELATED APPLICATION

The copending patent application of Donald J. Wolf et al., Ser. No. 601,987 filed Dec. 15, 1966 entitled: "IMPROVED SLICE MOUNTING," now abandoned and substituted by continuation application Ser. No. 7,355 filed Feb. 2, 1970, now U.S. Pat. No. 3,562,106 discloses a new and improved form of mounting and adjustment means for a slice lip of a paper machine and the present invention comprises an improvement on such apparatus.

### BACKGROUND OF THE INVENTION

#### 1. Field of the Invention

This invention relates in general to high-speed papermaking machinery and in particular to the slice lip of a papermaking machine which receives its stock from a headbox and directs it toward a fourdrinier wire.

#### 2. Description of the Prior Art

In high-speed papermaking machines employing a pressure headbox in order to produce sufficient flow of stock to uniformly produce paper at high speeds, the pressure inside the headbox is necessarily quite high. With such high pressures the pressure developed on the slice lip as the stock passes beneath it creates an upper force on the lip and within the headbox such that the headbox and slice body tend to be distorted or deflected. This may cause the clearance between the slice lip and the fourdrinier wire to vary thus reducing or increasing the slice opening. The forces on the slice lip may even tend to deflect the slice lip onto the fourdrinier wire. Various jacks, gear boxes and motors have been provided in the prior art to control the position of the slice lip against such forces. However, positive and accurate control has not always been obtained.

### SUMMARY OF THE INVENTION

The present invention relates to a fluid control for a slice opening of a headbox in which the slice lip is pivotally mounted to the headbox and its position controlled by using fluid pressure means such as air bags mounted between the slice lip and the main frame member of the machine on which the breast roll is rotatably supported. By controlling the pneumatic pressure in the air bags the position of the slice lip may be positively controlled to obtain an improved papermaking machine.

Other objects, features and advantages of the present invention will be readily apparent from the following detailed description of certain preferred embodiments thereof taken in conjunction with the accompanying drawings.

### BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a side view of a headbox and breast roll of a papermaking machine constructed in accordance with the principles of the present invention with certain parts of the headbox broken away; and

FIG. 2 is a front view of the papermaking machine of this invention.

### DESCRIPTION OF THE PREFERRED EMBODIMENT

The invention is illustrated in FIGS. 1 and 2 wherein a fragment of the forming end portion of a papermaking machine including a headbox 10 that has agitating rollers 11 and 12 mounted therein is disclosed. A lower slice lip 13 is connected to the lower portion 9 of the headbox wall 8 and an upper slice lip 17 is pivotally attached by the pivot pin 14 to the upper edge of the discharge outlet portion 16 of the headbox. An upper slice lip support 18 is connected to the upper slice lip 17 and a fluid pressure adjusting member 19 which might for example be an inflatable chamber is mounted between the support 18 and a deflection beam 21. Compression pads 22 and 23 are mounted on either side of the hydraulic chamber 19 as shown in FIG. 1 to distribute load over the inflatable chamber.

A conduit 24 is connected to the fluid pressure adjusting means 19 and has a valve 26 to regulate the pressure in the fluid pressure means 19. A supply tank 27 is connected to the valve 26 as shown.

A breast roll 28 is supported in a conventional fashion adjacent the headbox 10 and a fourdrinier wire 29 passes over the breast roll.

As shown in FIG. 2 the ends of the deflection beam 21 are formed with brackets 32 that are connected by pins 34 to links 33. For simplicity only one end of the beam 21 is shown but it is to be realized that both ends are supported in the same manner. The second ends of the links 33 are connected to brackets 36 by pins 37. The bracket 36 is mounted on the frame of the machine which also rotatably supports the breast roll 28 in a well known fashion.

A dimensional reference means 38 has a first portion 39 that is mounted on the frame of the machine and a second portion 41 which is connected by extension 42 to the upper slice lip 17. The end wall 43 is formed with a suitable slot to allow the extension 42 to move with the slice lip 17.

In operation the slice lip 17 may be controlled by adjusting the pressure in the fluid pressure means 19 with the valve 26. Since the deflection beam 21 is connected by the brackets 32 and links 33 to the frame of the machine, the deflection beam 21 does not move relative to the support axis of the breast roll. The fluid pressure means 19 moves the slice lip 17 about the pivot 14 and the position of the lip 17 is indicated by the position dimensional reference 38.

It is to be realized that in paper machines of the type disclosed that forces of a half million pounds or more may exist at the slice lip support. For example, in a particular embodiment the slice lip had to be adjusted up to about one-fourth of an inch movement during operation. If air is used as the fluid in the means 19, pressures in the general range of 120 p.s.i. would be encountered. Since the support axis of the breast roller 18 and the bracket 36 are supported on the main frame of the machine, the deflection beam 21 and the breast roll 28 will maintain a fixed spatial relationship. This will assure that the slice lip 17 maintains a fixed relationship with respect to the breast roll and it will not move with the headbox.

It is seen that the present invention eliminates all jacks, gears, gear boxes and motors in control of the slice and although the invention has been described with respect to a preferred embodiment, it is not to be so limited as changes, modifications may be made therein which would then fully define the scope of the appended claims.

I claim as my invention:

1. A papermaking machine comprising:

- a headbox;
- a breast roll in operative association with the headbox;
- a Fourdrinier wire turning about said breast roll;
- an upper slice lip pivotally attached to said headbox and extending therefrom over the breast roll and Fourdrinier wire;
- frame means connected to said breast roll and supporting said breast roll for rotation;
- a beam attached to said frame above said slice lip; and
- fluid pressure means mounted between said beam and said upper slice lip to adjust the tip of said slice lip relative to said breast roll.

2. The papermaking machine of claim 1 wherein a slice lip support is attached to said upper slice lip and said fluid pressure means engages said slice lip support and adjusts said slice lip along a radial line extending through the axis of rotation of said breast roll by moving said slice lip support.

3. The papermaking machine according to claim 2 wherein a pivot pin pivotally attaches said upper slice lip to said headbox.

4. A papermaking machine according to claim 3 wherein said fluid pressure means comprises a flexible fluid container.

5. A papermaking machine according to claim 4 comprising a supply tank fluidly connected to the flexible fluid container to control the position of said upper slice lip.

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6. A papermaking machine according to claim 5 comprising valve means connected between said flexible fluid container and said supply tank to control the pressure in said flexible fluid container.

7. The papermaking machine according to claim 6 including dimensional reference means for indicating the position of the slice lip relative to said breast roll and comprising a first por-

tion mounted on said frame and a second portion mounted on said upper slice lip.

8. A papermaking machine according to claim 6 comprising compression pads mounted on either sides of the flexible fluid container to distribute load over the container.

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