Jan. 16, 1973 L. TRUXA 3,711,368

ROLL SUPPORT FOR PAPER MACHINE DRAINAGE FOILS

Filed Oct. 30, 1970 2 Sheets-Sheet 1

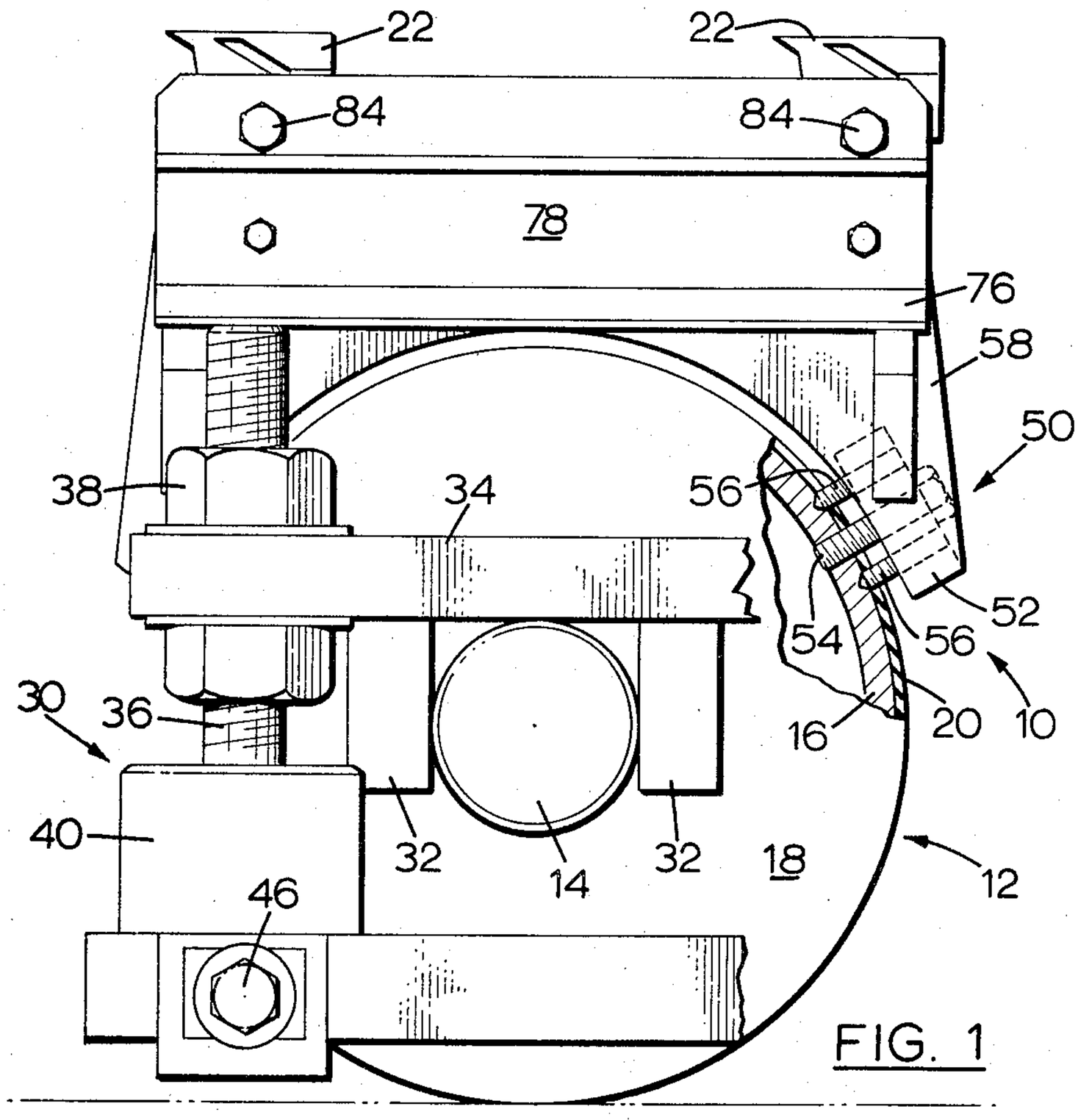


FIG. 1

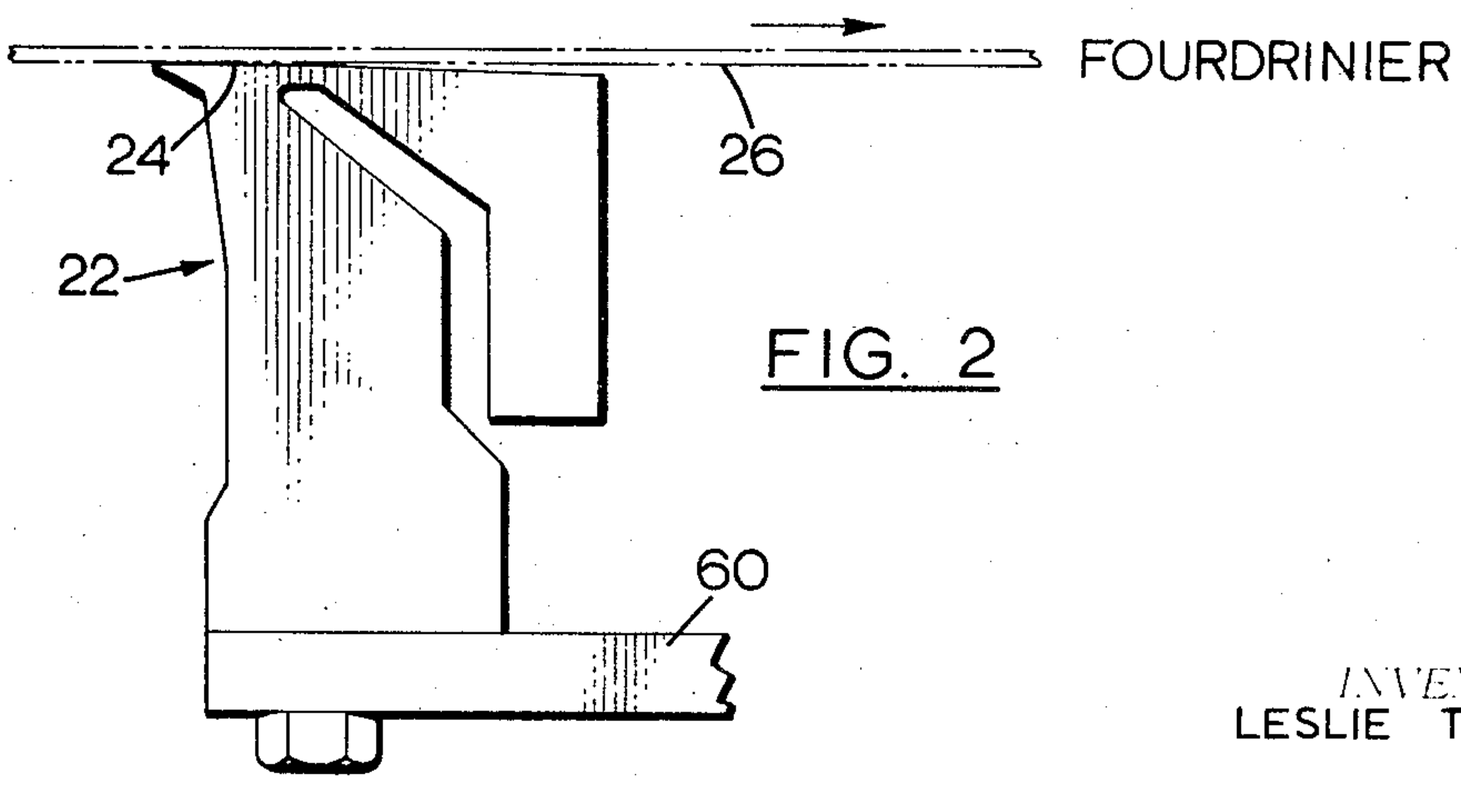


FIG. 2

INVENTOR.
LESLIE TRUXA

BY

Patent Agent

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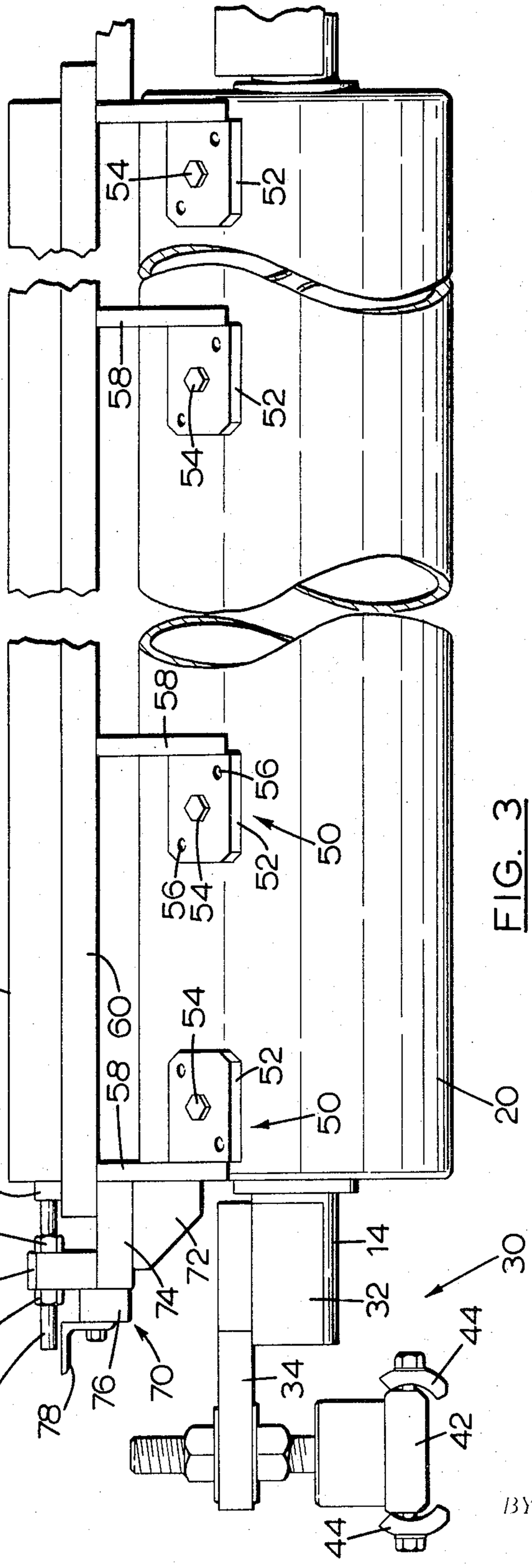


FIG. 3

INVENTOR
LESLIE TRUXA

BY

Patent Agent

United States Patent Office

3,711,368

Patented Jan. 16, 1973

3,711,368

ROLL SUPPORT FOR PAPER MACHINE DRAINAGE FOILS

Leslie Truxa, Montreal, Quebec, Canada, assignor to Dominion Engineering Works, Limited, Lachine, Quebec, Canada

Continuation-in-part of application Ser. No. 758,306, Sept. 9, 1968. This application Oct. 30, 1970, Ser. No. 85,828

Claims priority, application Canada, Sept. 27, 1967, 1,062

Int. Cl. D21f *1/36*

U.S. Cl. 162—354 3 Claims

ABSTRACT OF THE DISCLOSURE

Paper machine drainage foils are supported on a foil platform which in turn is supported on a roll assembly comprising a roll shell having a protective rubber cover and roll journals which support the roll shell at its ends. The roll shell extends transversely across the fill width of the paper machine and support for the platform is obtained by multiple pads transversely spaced along the roll shell and connected between the shell and the platform. Adjustment nuts located on posts which are connected to the roll journals function to control the vertical positioning of the roll shell and foils in relation to the Fourdrinier wire.

BACKGROUND OF THE INVENTION

This invention is directed to a foil mounting arrangement for use in web forming machine, particularly paper making machines, the application being a continuation-in-part of application Ser. No. 758,306, filed Sept. 9, 1968; now abandoned.

In the operation of web forming machines such as paper machines a layer of stock in liquid form is passed through a slice and deposited upon a moving Fourdrinier wire, to be dewatered. The extraction of water from the lower surface of the moving Fourdrinier wire has in the past been accomplished by rotating table rolls which by the fact of their rotation with the passage of the Fourdrinier wire thereover tends to suck water from the lower wire surface.

A comparatively recent development has been the introduction of water extraction foils, both of fixed and variable camber as a substitute for the table rolls. Owing to certain inherent operating characteristics such foils afford improved operation of the wet end of a web forming machine, and such machines may beneficially be converted from table rolls to the use of foils.

Owing to the considerable transverse extent of paper machines, which have spans in the order of 300 inches or more, the superstructure necessary to support a water exeraction foil in substantially unchanging relation with the undersurface of the wire over such extended spans necessitates the provision of a rigid support structure to ensure the required rigidity.

Certain aspects of the prior art is seen in the arrangements shown in U.S. Pats. Nos. 3,105,789, assigned to the present assignee, and No. 3,332,838.

The present invention provides an improved foil support structure of single, readily installed form, particularly suited for incorporating the superseded table rolls, by adaption. In carrying out the invention by means of such adaption it is necessary to maintain the desired spacial relationship between the effective foil working surface and the undersurface of the wire.

One problem posed by the utilization of table rolls as foil support structure is that while in operation a table roll presents a substantially level upper working surface in supporting and water extracting relation with the Fourdrinier wire passing thereover, the presentation of such a level surface is made possible in part by the rotation of the roll, which tends to straighten the roll into a non-sagging position. However, at standstill, such rolls generally sag in the center due to self weight. Accordingly it is necessary in utilizing a table roll as a supporting structure for a superposed water extraction foil to make provision for the sag of the roll. In practice it has been found that such correction is most easily effected by securing the foil attachment structure to the upper surface of the roll and then machining the foil attachment means to provide the requisite level supporting surface on which to mount the foil proper.

A particular benefit obtained in utilizing a foil support structure of hollow tube or roll form is the achievement of high resistance against twisting about the axis of the support. This is particularly significant in relation to the angular sensitivity of foils, where ½° deflection variation can cause a marked change in drainage rate. The need for uniformity in drainage in the cross machine direction will be appreciated by those skilled in the art.

One obvious advantage afforded in adopting an existing table roll is the freedom from corrosion that the roll cover provides.

It will be understood that the present invention is susceptible of use with fixed section and/or adjustable section water extraction foils, which are per se well known in the art.

A preferred embodiment of the invention is described for purposes of illustration reference being had to the accompanying drawings wherein:

FIG. 1 is a side view in part section showing a foil mounting arrangement according to the present invention;

FIG. 2 is a side view corresponding to FIG. 1, illustrating the working relationship between a mounted foil and the Fourdrinier wire of a paper machine; and

FIG. 3 is a back view of the arrangement according to FIG. 1 looking toward the wet end of the machine.

Referring to FIGS. 1 and 3 the foil mounting arrangement **10** comprises a roll assembly **12** in which a pair roll journals **14** support a roll shell **16** by way of end plates **18**, the shell **16** being coextensive in the cross-machine direction with the foils **22** and having a resilient rubber cover **20** over the surface thereof to preclude stock contamination.

Referring to FIG. 2, the foils **22** each have an upper surface **24** in supporting relation with the Fourdrinier lower surface **26**, which constitutes the effective machine datum previously determined by the upper surface of the table roll **12**.

The roll mounting arrangement of the illustrated embodiment comprises a pair of journal side plates **32** secured to the roll journal **14** as by welding, and attached to a bearer **34** secured to a pair of bearer support posts **36** (only one of which is illustrated). A pair of adjustment nuts **38** provides vertical positioning of the bearer **34** on the related posts **36**, for the vertical positioning of the foils **22** in relation to the Fourdrinier bottom surface **26**. The post **36** extends upwardly from a housing **40** which is carried by the support **42**, having side clamps **44** adjustably attached thereto by means of a nut and bolt arrangement **46**. The provision of adjustable side clamps is particularly suited for use with support structures such as the top flange of a dovetail or T-section attached to the top of the Fourdrinier beam.

Mounting of the foil support structure to the surface of the roll is achieved by means of mounting pad arrangement **50** in which a plurality of transversely spaced pads **52** generally uniformly distributed along the length of the roll **12** are secured to the surface of the roll by means of

retaining cap screws **54**, in conjunction with locating pins or set screws **56**. From each of the pads **52** a web plate **58** extends upwardly in supporting relation with the foil platform **60**, to which the fixed front portion of the foil is secured as by bolting, or in other suitable fashion.

The foil adjustment assembly **70** is mounted at one or both ends of the roll by means of bracket **72** in supporting relation with a plate **74** carrying an end plate **76** to which an indicator **78** is attached, being in the form of angle section, the upper surface of which is graduated as an indicator surface. A pedestal **80** secured to the plate **74** receives the foil adjustment bolt **82**, secured in relation thereto by means of adjusting and locking nuts **84**. Adjustment of the bolt **82** relative to the fixed pedestal **80** positions the foil cam plate **94** in relation to the immovable portion of the foil, in the case of an adjustable foil.

In effecting the conversion of a table roll the method of procedure to be followed, which the foregoing structure permits being carried out remote from the paper machine, comprises the steps of attaching the roll mounting assembly **30** to the journals **14** of the roll **12**, locating and attaching the mounting pad assemblies **50** in aligned and uniform arrangement, and securing the web plates **58** and foil platform **60** thereto. This method of assembly includes the step of machining the assembled foil mount, either by levelling the top of the web plates **58**, or the foil platform **60** prior to the assembly of the foils **22** thereon, so that accurate levelling of the foils transversely of the machine is obtained despite any sag in the roll **12**, which is a generally inherent characteristic of such table rolls.

Certain advantages provided by the foregoing structure include interchangeability of foil mounting, a substantial financial saving in the adaptation of foils to an existing Fourdrinier section, and ready adjustment of the foils of the Fourdrinier section during operation of the machine. In addition to the foregoing, it will be understood that the number of foils which may be substituted for a table roll is not limited to the pair of foils illustrated, and that the foils may be of the adjustable type, or alternatively of the more simple fixed type of foil.

What I claim as new and desire to secure by Letters Patent of the United States is:

1. A water extraction device for use in a web forming machine having a stretched Fourdrinier wire in running relation therein to provide a web forming surface when

in operation, including at least one water extraction foil member extending transversely of said wire, having a top working surface extending in supporting relation with the wire to draw water therefrom, platform means coextensive in the cross-machine direction with the foil in supporting relation therewith, a plurality of spaced mounting means extending downwardly from said platform means to support said foil in substantially uniform wire supporting relation, tubular support means extending transversely the full width of the machine having said mounting means secured thereto, and mounting means attached to the ends of said tubular supporting means, for securing said support means transversely of the machine structure in predetermined spaced relation beneath said wire said tubular support having a metallic shell with a protective resilient cover extending over the face thereof to preclude stock contamination, said mounting means extending through the cover and secured to the shell whereby said foil is supported in substantially non-resilient relation relative to the wire.

2. The device as claimed in claim **1** having a plurality of said water extraction foil members mounted on said platform means in sequential water extracting relation.

3. The device as claimed in claim **1**, said tubular support mounting means including height adjustment means to permit variation in the spacing of said tubular support means beneath said wire for levelling said foil.

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S. LEON BASHORE, Primary Examiner

R. H. TUSHIN, Assistant Examiner

U.S. Cl. X.R.

162—199, 272, 352, 374