June 21, 1960 J. J. FUSCO 2,941,593

FOURDRINIER WIRE STRETCH

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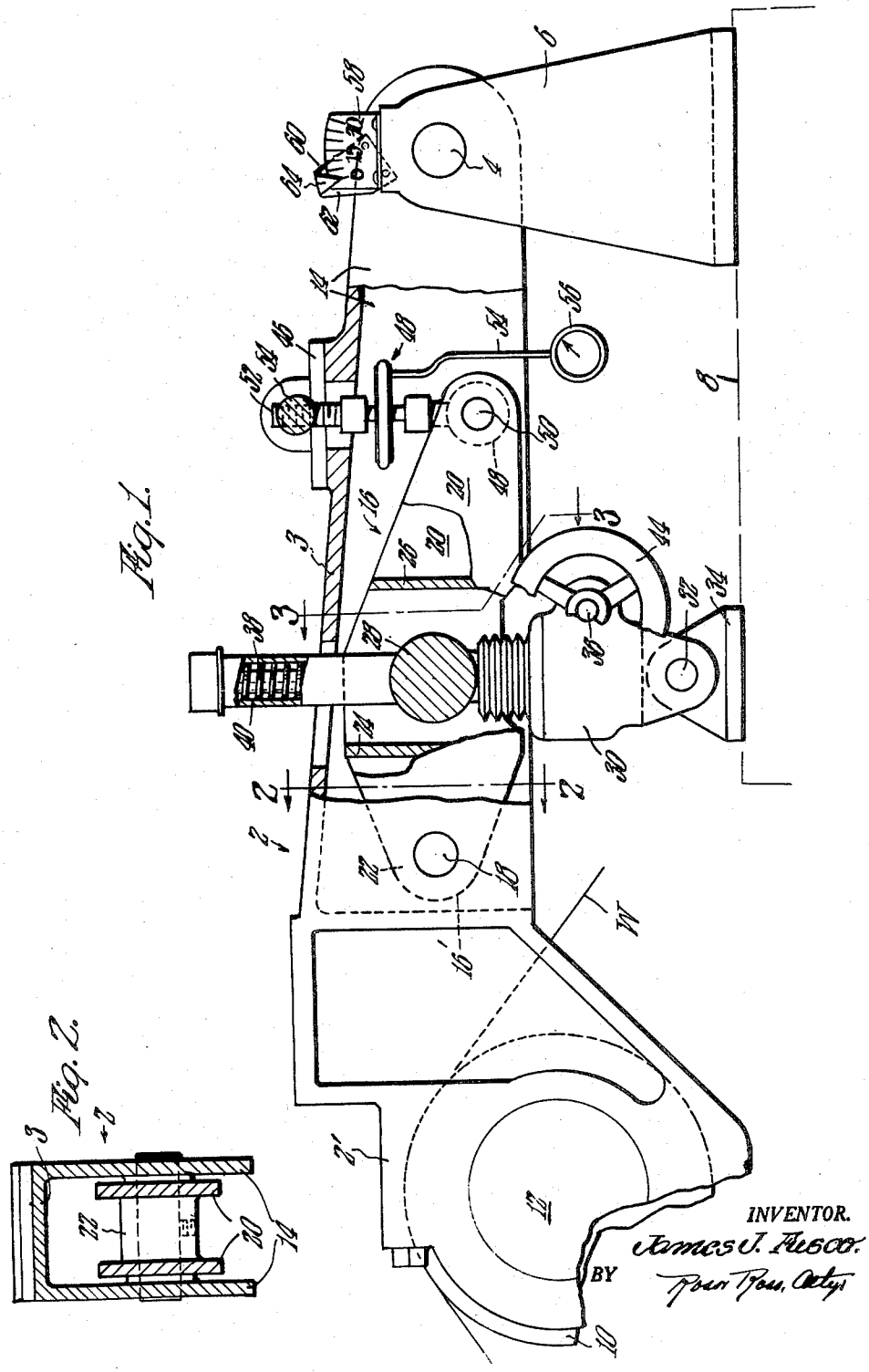


Fig. 1.

Fig. 2.

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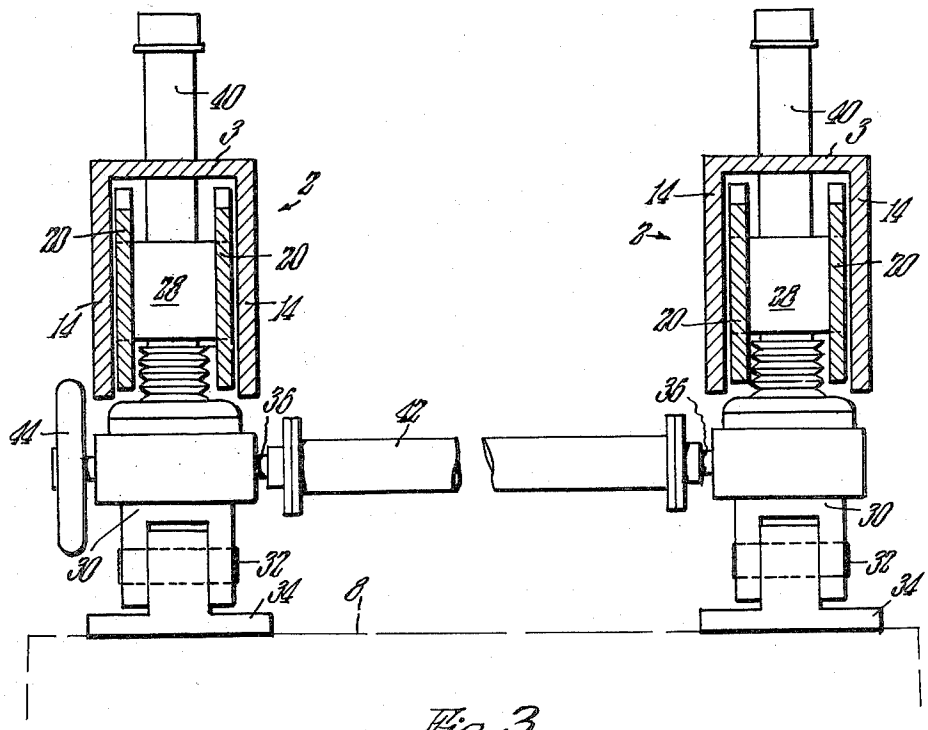


Fig. 3.

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FOURDRINIER WIRE STRETCH

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6 Claims. (Cl. 162—273)

This invention relates to improvements in paper making apparatus, and is directed to improvements in stretch or tensioning apparatus for the Fourdrinier wire of a paper making machine.

The principal object of the invention is the provision of novel stretch or tensioning apparatus for the lower run of the endless Fourdrinier wire of a paper making machine.

Wire tension of a Fourdrinier wire is commonly selected for the characteristics of the paper being formed, the speed of the wire, the nature of the paper stock, and other variables. It is necessary and desirable that the wire be sufficiently taut to properly grip the couch roll or other roll, by which it may be driven, and to properly grip the breast, table and other rolls for driving same.

While tension of the wire may be varied with different grades of stock or paper, it is necessary to determine the degree of tension at all times, in order to obviate damage and excessive wear of the wire, deflection of various rolls, etc.

According to novel features of the invention, means is provided for easily and readily adjusting the tension of the wire within narrow limits, even during operation of the machine, and it is possible, at all times, to know the tension of the wire by which the most efficient machine operation results.

According to novel features of the invention, a pair of side arms are provided, one for each side of the machine or wire, which are pivoted at outer or rear ends for swinging, and carry a roll for engaging the wire at inner forward ends. Jack means is provided intermediate the ends of the side arms and operatively connected to said side arms bring about the desired movements or adjustments thereof, and at the same time to hold said arms in adjusted positions.

As distinguished from prior art tensioning apparatus, a pair of side arms are pivoted at corresponding outer ends to supporting means for the swinging of inner ends thereof which have a wire engaging roll between and journalled therein. An elongated inner arm within each side arm has its inner end pivoted thereto, and an outer end of one of said inner arms acts on a load cell connected between said one end and the outer related side arm and has a pressure gauge operatively connected thereto. Simultaneously operable jack mechanisms exert upward forces to the inner arms intermediate outer and inner ends thereof so that through said one said inner arm on the load cell, pressure conditions are reflected by the gauge. The apparatus is very sensitive, and it is possible to obtain tension adjustments within very narrow limits.

According to special features of the invention, the angularity of the side arms, or angle of the wire relative to a line, and pressure indications may be correlated in the form of a chart or graph so that wire tension may be readily determined or a predetermined tension of the wire may be attained.

Various changes and modifications may be made in the

form of apparatus, within the spirit and scope of the invention, which for purposes of disclosure is shown in the accompanying drawings wherein:

Fig. 1 is a side elevational view of the apparatus with portions broken away for clearness;

Fig. 2 is a sectional elevational view on the line 2—2 of Fig. 1; and

Fig. 3 is a sectional view on the line 3—3 of Fig. 1.

Referring now to the drawings in detail, the novel features of the invention will be described.

A pair of side arms, such as 2, are provided, one for each side of the paper machine and Fourdrinier wire. These arms are swingable at rear or outer ends on pivot pins 4, of stands, such as 6. Said stands 6 may be supported in any suitable manner on a floor or foundation, indicated by the dash lines 8.

A roll 10 has ends or a shaft 12 freely rotatable in the inner forward ends 2' of the arms 2, and is arranged for engagement with the lower run of the Fourdrinier wire indicated by W between relatively spaced wire guide rolls, as is the roll indicated by 41, in U.S. Patent No. 2,360,773 of October 17, 1944, issued to F. A. Helin.

In the form of the invention being disclosed, the Fourdrinier wire W engages the upper side of the roll 10, as indicated in Fig. 1, but the wire could engage the lower side, should that be desired.

For strength and rigidity, the arms 2 are preferably formed with transversely spaced side portions 14 to provide a space therebetween, and are connected with wall portions such as 3.

Inner arms 16 are provided which may be similar in form, and are disposed between the side portions 14 of the side arms 2.

Rear outer ends 16' of said arms 16 are pivoted on pins 18 of the side arms 2, and are preferably formed with transversely spaced side portions 20 connected together by transverse portions 22, 24 and 26.

Pivot pins, such as 28, are turnable in the side portions 20 of the inner arms 16.

Jack mechanism, indicated generally by 30, is of a well known type, and are swingable at lower ends on pivots 32 of brackets 34 which may be secured to the foundation 8.

Said jack mechanism 30 is of the well known worm gear type having shafts 36 carrying worms in mesh with worm gears which, as they are rotated by the worms, rotate upwardly extending jack screws 38 which are enclosed in tubes 40. The screws 38 are in threaded engagement with the pivot pins 28.

The shafts of the jack mechanism are connected by a torque tube 42. As the shaft 36 of one jack is rotated by a hand wheel 44 fixed thereto, the screws 38 are simultaneously rotated to raise and lower the inner arms 16 on their pivots 18.

Bracket means 46 is secured to one of the side arms 2. A volumetric load cell 48 of well known form has a lower end connected by an eye bolts 48' to a pivot pin 50 of the forward end of one of the inner arms 16. The upper end of the cell is connected by a threaded member 52 to a rod 54 of the bracket 46 for adjustment. The load cell 48 is connected by 54 to a suitable pressure indicating device, such as a gauge 56, which may be conveniently located.

An indicator 58 is secured to one of the stands 6, and a member 60 is secured to the adjacent end 62 of a side arm 2, and is provided with a pointer 64 for registering with indicia shown on the indicator 58.

The volumetric load cell is very sensitive in operation, and being connected between member 54 and end of arm 16, very slight movements up or down of the arm 16 relative to the arm 2 are indicated by the pressure gauge 56,

As the screws **38** of the jack mechanisms are rotated in one direction, the arms **2** are swung clockwise through their connections with the arms **16**, and the outer end of the one arm **16** applies force to the load cell and pressure is indicated by the gauge **56**. As said screws **38** are rotated in an opposite direction, the reverse is true. Thus the action of the roll **10** on the wire is converted to pressure indications.

The degree of wrap of the wire on the roll **10**, and the angle of the wire from the roll to an adjacent guide roll are factors pertaining to the tension of the wire, and the angularity of the members **2** are related thereto.

It can be determined that, with certain angular positions of the arms **2**, and certain pressure indications of the gauge, certain wire tensions exist. By correlating angles and pressures, a graph or chart may be prepared from which the wire tension may be determined, or a desired predetermined tension may be assured by a certain angle and pressure indication.

As shown and described, there is an inner arm **16** between the side portions **14** of each side arm **2**.

Fig. 1 is a side elevational view of what may be termed the front or tending side of the apparatus, on which side the gauge **56**, and indicating mechanism **58** and **64** may be observed.

In lieu of an arm **16** associated with each side arm **2**, it may be desired to employ but one inner arm **16**, and that to be disposed in the arm **2** at the front or tending side of the apparatus.

In such case, the pivot pin **28** for the jack mechanism, will be connected directly to the side portions **14** of the arm **2** at the rear side of the apparatus.

Various changes and modifications may be made in apparatus within the limit and scope of the invention, and it is preferred to be limited, if at all, by the appended claims rather than by the foregoing.

I claim:

1. Apparatus for tensioning the endless Fourdrinier wire of a paper machine comprising, a pair of elongated transversely spaced outer side arms disposed on opposite sides of a paper machine and having corresponding outer and inner ends, means pivotally supporting the outer ends of said arms for the swinging up and down of the inner ends thereof, a roll disposed between and rotatably journalled in the inner ends of said outer side arms for engaging a Fourdrinier wire, an elongated inner arm adjacent each of said outer side arms, a pivotal connection between the inner end of each said inner arm and the inner end portion of the adjacent said outer side arm for the swinging of the outer ends of said inner arms relative to the said outer side arms, pressure indicating means connected between the outer end of one of said inner arms and the adjacent said outer side arm, a jack mechanism operable on a member rotatably provided on each said inner arm, and means to simultaneously operate said jack mechanisms.

2. Apparatus for tensioning a Fourdrinier wire as set forth in claim 1 wherein said outer side arms are provided with transversely disposed side members and said inner arms are disposed between the side members of said outer side arms.

3. Apparatus for tensioning a Fourdrinier wire as set forth in claim 1 wherein said pressure indicating means includes a volumetric load cell having a pressure indicating gauge operably connected thereto.

4. Apparatus for tensioning the Fourdrinier wire of a paper machine comprising, a pair of transversely spaced elongated outer side arms disposed on opposite sides of the paper machine and each having outer rear and inner forward ends with a wire engaging roll disposed between and journalled in said inner ends, means pivotally supporting the outer rear ends of said outer side arms for up and down movements of the inner forward ends thereof an elongated inner side arm for each said outer side arms having outer rear and inner forward ends, pivotal connections between the inner forward ends of the adjacent outer and inner side arms for the swinging of the outer ends of said inner side arms, a volumetric load cell interposed between and pivotally connecting the inner forward end of one of said inner side arms and one of said outer arms, interconnected and simultaneously operable jack members and operable connections with each of said inner side arms intermediate opposite ends thereof for swinging forward ends of said inner side arms up and down to swing inner forward ends of said outer side arms up and down, means for indicating the angularity of said outer side arms, and pressure indicating means connected to said load cell.

5. Apparatus for tensioning a Fourdrinier wire as set forth in claim 4 wherein said means for indicating angularity includes indicia provided on the means pivotally supporting said outer side arms and a member provided on one of said outer side arms and being registrable with said indicia.

6. Apparatus for tensioning a Fourdrinier wire as set forth in claim 4 wherein said operable connections include members rotatable in said inner side arms and threaded stems provided on said jack mechanisms threadedly engaging said rotatable members.

References Cited in the file of this patent

UNITED STATES PATENTS

1,582,323	Warren	Apr. 27, 1926
1,743,970	Kilberry	Jan. 14, 1930
1,885,163	White	Nov. 1, 1932
2,360,773	Helin	Oct. 17, 1944
2,760,411	Baxter	Aug. 28, 1956