July 10, 1928. 1,676,305

R. V. WELDON

PAPER MAKING

Filed June 10, 1927 2 Sheets-Sheet 1

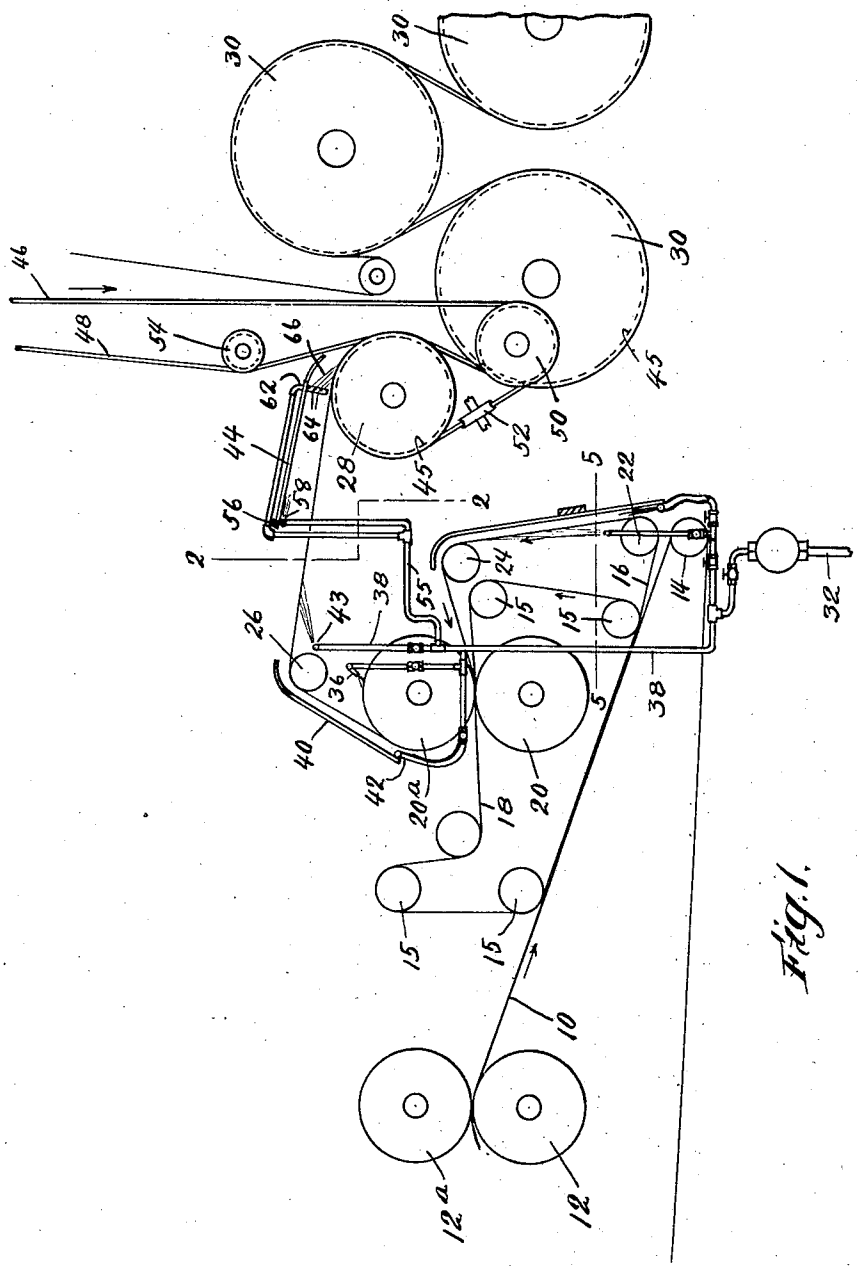


Fig. 1.

Inventor.
Roy V. Weldon
by
Atty

July 10, 1928. 1,676,305

R. V. WELDON

PAPER MAKING

Filed June 10, 1927 2 Sheets-Sheet 2

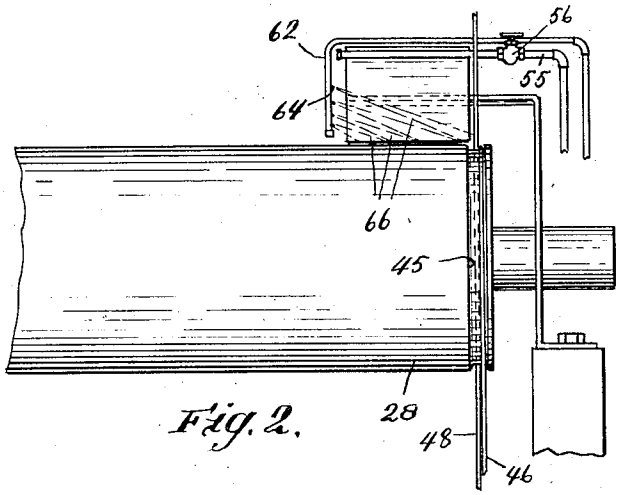


Fig. 2.

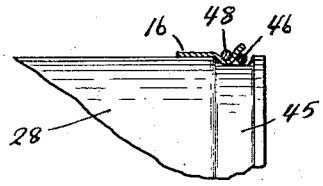


Fig. 4.

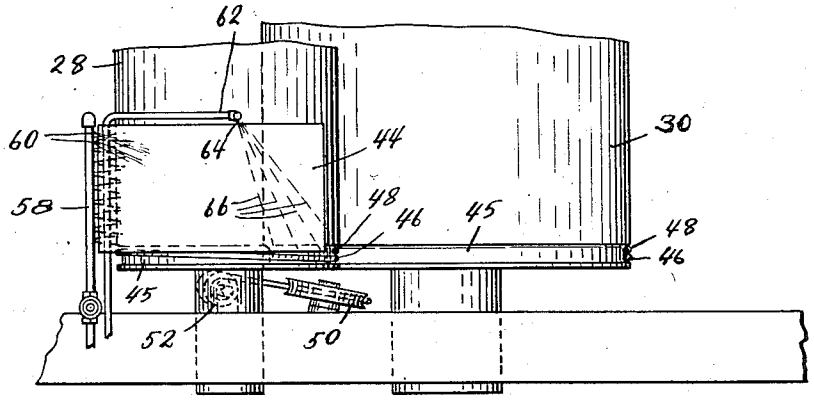


Fig. 3.

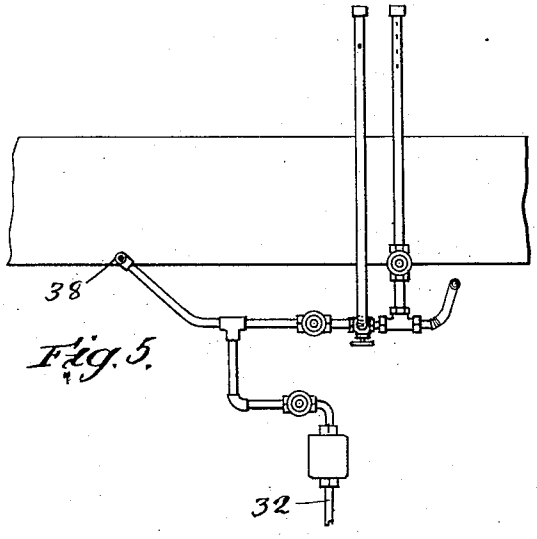


Fig. 5.

Inventor.
Roy V. Weldon
by
Atty

Patented July 10, 1928.

1,676,305

UNITED STATES PATENT OFFICE.

ROY VICTOR WELDON, OF MILLINOCKET, MAINE, ASSIGNOR TO GREAT NORTHERN PAPER COMPANY, OF MILLINOCKET, MAINE, A CORPORATION OF MAINE.

PAPER MAKING.

Application filed June 10, 1927. Serial No. 197,955.

This invention relates to paper making machines and especially to an apparatus and a method of transferring the moving paper sheet and particularly the lead strip thereof from the last press into the drier and for passing it automatically about the drying rolls of the drier.

The driers of some paper machines are provided with a pair of bands or ropes, known as Sheahan ropes, which extend between and around the drying rolls of the drier for the purpose of gripping the lead strip and carrying it automatically through the drier and around the rolls theeof.

This invention is particularly desirable in machines in which the paper is passed through the last press reversed and may be regarded when so used as an improvement on the Pope Patent No. 1,338,094, dated April 27, 1920. The Pope patent reverses the paper by air and uses air currents to carry it to the driers but does not indicate any automatic means to transfer the paper to the bite of the Sheahan ropes. This may be done by hand on slow running-machines but an automatic device has obvious advantages.

It is an object of this invention to provide an apparatus and a method for automatically guiding the lead strip from the last press into the bite between said ropes so that it will be carried automatically through the drier without the necessity for performing the operation manually.

A further object is generally to improve the construction and operation of paper making machines.

Fig. 1 is a diagrammatic side elevation of the construction of a paper making machine embodying this invention at the end of the last press and at the beginning of the drier.

Fig. 2 is a detail view taken along line 2—2 of Fig. 1.

Fig. 3 is a plan view of the showing of Fig. 2.

Fig. 4 is a detail view illustrating the manner in which the lead strip is held between the carrier ropes.

Fig. 5 is a plan view of the air-blast piping at the press taken along line 5—5 of Fig. 1.

As here shown, the press roll felt 10 of the paper making machine is represented as passing from an intermediate set of press rolls 12 and 12ª around a guide roll 14 and carrying upon it the paper web or a lead strip 16 thereof. Above this portion of the press roll felt is a second press roll felt 18 running around guide rolls 15 and between the end pair of press rolls 20 and 20ª. The upper web is transferred from the press roll felt 10 to the press roll felt 18 by passing it over the guide rolls 22 and 24 at a point just before felt 18 passes between the press rolls 20 and 20ª. In this way, it will be observed that the paper is reversed with relation to the press roll felts, the surface of the paper sheet in contact with the press roll felt 10 being uppermost while the surface not in contact with the press roll felt 10 is underneath and in contact with the press roll felt 18.

The moving web of paper then passes in contact with the upper press roll 20ª and is removed therefrom by air blasts and is guided over a roller 26 and thence to the drier, where it passes first over the baby drier 28 and thence in succession about and between the large drying rolls 30. The paper web is transferred from the press roll felt 10 about the rollers 22 and 24 and into the bite of the press rolls 20 and 20ª by suitable air blast apparatus such as shown in the Charles E. Pope Patent No. 1,338,094, dated April 27, 1920. The high pressure air is supplied to the air blast apparatus from a pipe 32 and is reduced to a lower pressure in the apparatus by a pressure regulator of any suitable construction, which pressure regulator is arranged to maintain the pressure of air at the air blasts constant regardless of the number of air blasts in operation. Uniformity of air blast pressure is desirable to insure satisfactory operation under all conditions.

The lead strip 16 is detached from the upper press roll 20ª by means of opposed air blasts discharged from nozzles 36 connected with the pipe 38 and the lead strip is guided onto the roll 26 by said blasts assisted by the guide plate 40 and air blasts passing between the web and the guide plate from suitable nozzles 42. The lead strip is guided over the space between the roll 26 and the baby drier 28 by suitable upwardly inclined air blasts issuing from a pipe 43 disposed in front of the roll 26. The arrangement of the air blasts is about as shown in the Pope patent above referred to. A longitudinally extended guide plate 44 is disposed above the baby drier 28 at one end thereof and ex-

tends to a point about midway between the press rolls and the drier and is adapted to guide the lead strip downwardly and onto the roll 28. The drier is provided with rope carriers for the lead strip and the paper web arranged about as shown in the William Sheahan Reissue Patent No. 13,925, dated June 8, 1915, for engaging the margin of the lead strip or paper web and carrying it automatically through the drier. The drier rolls are each formed with a peripheral groove 45 therein at one end in which a pair of endless ropes 46 and 48 are received side by side. The rope 46 passes downwardly around sheaves 50 and 52 and thence upwardly into the groove 45 of the baby drier and lies in the outer portion of the groove. The rope 48 passes downwardly about a sheave 54 and at an angle as shown in Fig. 1 into the inner side of the groove of the baby drier and lies adjacent the other rope 46. Both ropes then travel side by side between and about the successive drying rolls of the drier.

The lead strip is adapted to be directed on top of the rope 46 in the groove of the baby drier and under the rope 48 as it passes into the groove so that the margin of the lead strip is caught between the ropes in the manner illustrated in Fig. 4 and is wrapped about the baby drier and is caused to be carried along with the ropes through the driers and about the drying rolls in succession. Apparatus is herein provided for automatically causing the lead strip to pass into the bite or nip of the ropes. To this end a horizontal pipe 55 connected with the pipe 38 through a valve 56 is disposed beneath and at the rear edge of the guide plate 44 and has a plurality of orifices 58 which direct air blasts longitudinally along the under face of said guide plate to assist in carrying the paper web therealong. Said pipe is provided with one or more orifices 60 located in the outer end of the pipe at an angle to direct air blasts diagonally under said guide plate and toward the bite of the ropes so that the paper web is urged laterally toward the ropes. A second pipe 62 is vertically disposed at the inner edge of the guide plate 44 and over the body drier and has a plurality of orifices 64 therein which are so disposed that they direct blasts of air 66 diagonally downward over the baby drier and towards the bite of the ropes and provide, in effect, a diagonally moving curtain of air which engages the lead strip and causes it positively to assume a position over the rope 46 and under the rope 48, thus to be caught by the ropes and to be carried around the baby drier and thence in succession around the large rolls 30 of the drier. The air blasts 66 also serve to blow any loose ends that may be carried through the machine out of the drier and onto the floor.

After the lead strip has been passed into the bite of the carrier ropes, the sheet can be widened out to full width in the usual manner.

I claim:

1. The method of guiding the paper web of a paper making machine into the carrier ropes of the drying rolls which consists in directing the web to move toward the ropes and mainly at one side thereof, and deflecting the web in front of the ropes laterally toward the ropes by a blast of air directed onto the web in front of the ropes at an angle to the path of movement thereof and toward the ropes.

2. The method of passing a paper web between the press and drier of a paper making machine and into the bite of the carrier ropes of the drier which consists in causing the paper web to move across the gap between the press and the first drying roll by its momentum, supporting the web in its passage by blasts of air directed along the path of movement of the web, and deflecting the web in front of the ropes laterally toward the ropes by directing a blast of air onto the web at the first drier at an angle to the path of movement of the web and toward the bite of the carrier ropes.

3. The method of guiding a paper web to pass into the bite of carrier elements adapted to engage a marginal edge of the web, which consists in moving the web in a direction toward and mainly to one side of the carrier elements, and deflecting the web laterally toward the carrier elements by directing a blast of air onto the web in front of the carrier elements and at an angle to the direction of movement of the web and toward the carrier elements.

4. The method of guiding a paper web into the bite of carrier elements adapted to engage the marginal edge of the web which consists in causing the web to move toward said elements and mainly at one side thereof and deflecting the web laterally by blasts of air impinging thereagainst at an angle to the path of movement of the web and in a direction to cause it to enter the carrier elements.

5. The method of passing the paper web from the press into the drier of a paper making machine which consists in detaching the paper web from the press felt and guiding the paper web to pass into the bite of web-reversing press rolls by blasts of air directed onto the web transversely of the path of movement thereof at the felt and thence along the path of movement thereof into the press rolls, causing the paper web to move by its momentum across the gap between the press rolls and the first drying roll of the drier, guiding and supporting the paper web during such passage by blasts of air directed mainly longitudinally of the path

of movement of and beneath the web, and guiding the web to enter the bite of carrier ropes of the drier which are adapted to engage a margin of the web by directing a blast of air against the web ahead of the carrier elements and at an angle to the path of movement of the web and toward the carrier elements, whereby to deflect the moving web laterally and into the bite of the carrier elements.

6. In a paper making machine, the combination with a drier having a pair of carrier elements extended around and between the drying rolls of the drier to carry the paper web through the drier, means for automatically introducing the paper web between said carrier elements comprising apparatus for moving the paper web toward the first drying roll and mainly at the side of the carrier elements, and apparatus for producing a jet of air which is directed onto the paper web transversely of the path of movement of the paper web and toward the carrier elements to cause the web to be deflected laterally toward and enter between said carrier elements.

7. In a paper making machine, the combination with a drier having a pair of conjointly-operating carrier elements extended about and between the drying rolls to engage the margin of and carry the paper web through the drier, of apparatus for guiding the paper web to pass to the first drying roll of the drier, of means for automatically introducing the paper web between said carrier elements comprising apparatus for moving the paper web toward the first drying roll and mainly at the side of the carrier elements, and apparatus for producing a jet of air which is directed transversely of the path of movement of the paper web and toward the carrier elements to impinge against the paper web and cause it to be deflected laterally and enter between said carrier elements.

8. In a paper making machine, the combination of a drier having a pair of conjointly-operating carrier elements extended about and between the drying rolls to engage and carry the paper web through the drier, apparatus for guiding the paper web to pass to the first drying roll of the drier, and apparatus for deflecting the paper web laterally at its pass to the first drying roll into said carrier elements.

9. In a paper making machine, the combination with a drier having a pair of conjointly-operating carrier elements extended about and between the drying rolls to engage and carry the paper web through the drier, of apparatus for guiding the paper web to pass to the first drying roll of the drier, and apparatus for deflecting the paper web laterally into said carrier elements including a pipe disposed above the first drying roll on the side of the paper web opposite the carrier elements having provision for directing a blast of air toward the carrier elements and transversely of the path of movement of the paper web.

10. In a paper making machine, the combination with a press and a drier having a pair of conjointly-operable carrier elements extended about and between the drying rolls of the drier, of means to cause the paper web to pass from the press to the drier, and apparatus for deflecting the paper web laterally of its path of movement at said pass and between and into engagement with said carrier elements.

11. In a paper making machine, the combination with a press and a drier having a pair of conjointly-operable carrier elements extended about and between the drying rolls of the drier, of means to cause the paper web to pass from the press to the drier, and apparatus for deflecting the paper web laterally of its path of movement at said pass and between and into engagement with said carrier elements, including a longitudinally extended guide plate disposed between the press and the drier and above the path of movement of the web therebetween and above the first drying roll, means to direct a blast of air under and along the length of and in contact with said plate, and means disposed above said first drying roll and at the side of said guide plate opposite said carrier elements arranged to direct a blast of air forwardly toward said carrier elements and diagonally of the path of movement of said web and against the web, whereby to deflect it laterally and into engagement with said carrier elements.

12. In a paper making machine, the combination with the press and the drier having a pair of conjointly-operable carrier elements extended about and between the drying rolls at one end thereof, of means for guiding the web into engagement with said carrier elements comprising air blasts to support the paper web in its pass between the press and the drier, a guide plate disposed above the pass of the web and above the first drying roll, means to direct blasts of air under and in contact with said guide plate in a direction longitudinally thereof and over the paper web, and means disposed above the first drying roll and on the side of said guide plate opposite said carrier elements for directing a blast of air forwardly in the direction of the carrier elements and transversely of the path of movement of the paper web, to impinge against the paper web and deflect it laterally into engagement with the carrier elements.

13. In a paper making machine the combination with a pair of spaced web supporting rolls, of means for automatically transferring the web between said rolls, comprising means for directing a blast of air

against the paper web in the direction of movement thereof, and other means for directing a blast of air against the paper web at an angle to the path of movement thereof.

14. In a paper making machine, the combination of drying cylinders, two pairs of press rolls and their respective felts arranged to reverse the direction of movement of the paper in passing from one to the other of said pairs of rolls, and rolls for guiding the paper as it passes from one of said felts to the other and from the latter felt to the drying cylinders, means for automatically transferring a lead strip from the first felt through the second pair of press rolls and from the latter pair of rolls to the drying cylinders, said drying cylinders having a pair of conjointly-operable web carrying elements passed about and between said cylinders at one end thereof, and means for passing the web into engagement with said carrier elements including apparatus to direct a blast of air against the paper web in a direction transversely of its path of movement between the press and the drying cylinders and toward said carrier elements to deflect and cause it to enter the engagement of said carrier elements.

15. In a paper making machine, the combination of a series of drying rolls, a rope wrapped about and extending between said drying rolls at one end thereof, a second rope passed onto the first drying roll of the series at an angle with and in position to lie beside the first rope and thence about and between the drying rolls with said first rope, and means to guide a lead strip of the paper web to pass over the first rope and under the second rope at the first drying roll comprising apparatus for guiding the lead strip to pass to the first roll mainly at one side of the ropes, and means to direct a blast of air forwardly toward said ropes and at an angle to the direction of movement of and against the lead strip, whereby to deflect it laterally into engagement with said ropes.

In testimony whereof, I have signed my name to this specification.

ROY VICTOR WELDON.