

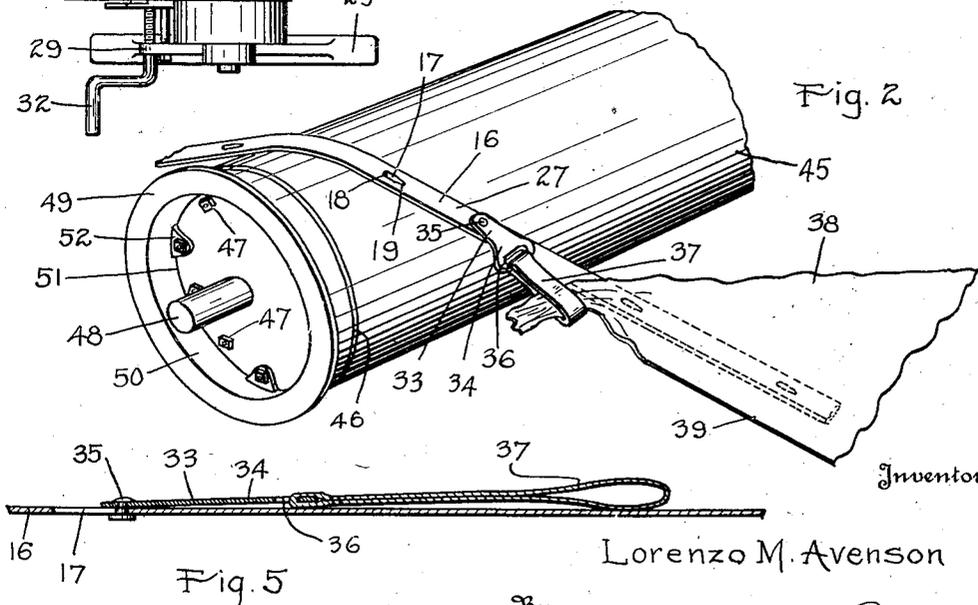
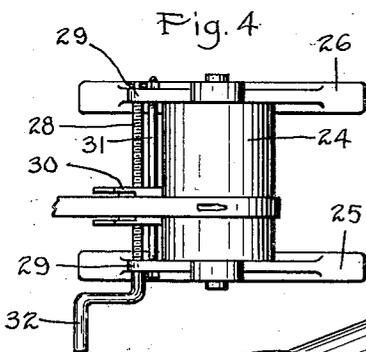
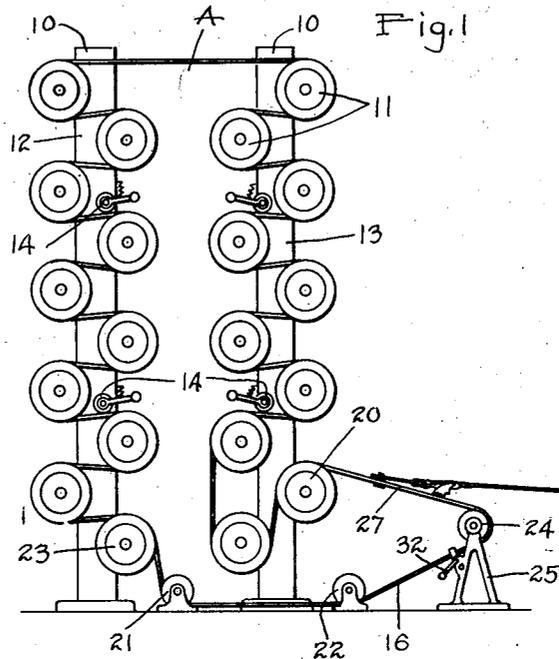
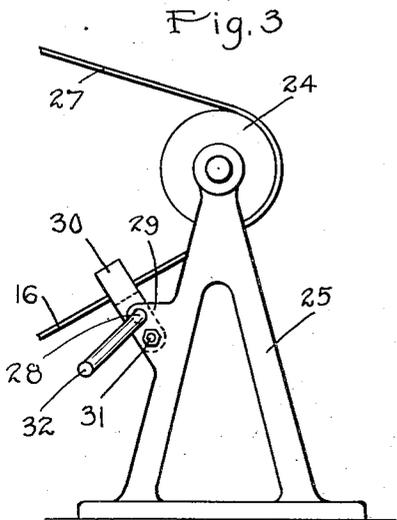
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L. M. AVENSON

THREADER FOR PAPER DRYING MACHINES

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UNITED STATES PATENT OFFICE.

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THREADER FOR PAPER-DRYING MACHINES.

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My invention relates to improvements in threaders for paper drying machines, an object of the invention being to provide a continuous tape passing successively around the various drier rolls of a drier and adapted to thread a paper web around said rolls in starting the machine, or when the web for any reason becomes broken.

Another object of the invention resides in providing a device for shifting the tape along the drier rolls to guide said tape to one side of the web, running over said rolls, so as to permit said web to travel through the rolls free from said tape.

A still further object resides in providing key slots at frequent intervals along said tape, and in providing a leader having a head adapted to be inserted into any one of said slots and detachably held therein, said leader having attached to it a flexible sling to receive the leading end of a web and lead said web along with the tape, as said tape passes over the rolls of the drier.

With the foregoing and other objects in view, which will appear in the following description, the invention resides in the novel combination and arrangement of parts and in the details of construction herein-after described and claimed.

In the drawings:

Fig. 1 is a diagrammatical side elevational view of a drying machine illustrating an embodiment of my invention applied thereto.

Fig. 2 is a perspective view drawn to an enlarged scale, said view illustrating a portion of the receiving roll of the drying machine and a portion of the tape passing thereover, also illustrating the method of attaching the leading end of a paper web to said tape.

Fig. 3 is a side elevational view illustrating an auxiliary roll over which the belt passes, also mechanism for shifting the belt along this roll and along the rolls of the drier.

Fig. 4 is a plan view of the structure shown in Fig. 3.

Fig. 5 is an enlarged longitudinal sectional view of the leader secured to the tape.

It has been customary in the drying of paper with the usual drying machines to employ several men for the sole purpose of

threading the paper web around the drier rolls whenever the machine was started or the web became broken. This practice has continued in spite of several attempts to employ threading devices for automatically threading the web about the rolls, the principal objection to said threading devices being that the paper web either had to come in contact with the threading tape at all times, or had to be shifted laterally in the machine in order to be engaged by the threading device. My invention provides an effective and positive device including an endless tape for automatically feeding and threading a web about the drier rolls of a drier, which tape may be shifted to one side of the path of the paper web, so as to allow said web to travel freely along the drier rolls, and which may be readily shifted back into the path of the web whenever it becomes desirable to attach the web to said tape.

For the purpose of illustrating the application of my invention, I have shown diagrammatically in Fig. 1 a paper drying machine indicated in its entirety at A. This machine consists of a plurality of tiers of drier rolls 11 arranged in alternate and staggered relation and journaled for rotation upon uprights 12. Although I have shown but two such tiers of rolls in the drawing, it can readily be understood that paper machines employing any number of said tiers of rolls may be equally well equipped with my invention. Constructed in the usual manner, each drier roll 11 includes a cylindrical shell 45 and heads 46 secured to the ends of said shell by bolts 47. These drier rolls 11 are carried on shafts 48, journaled on the uprights 12, and are provided with means (not shown) for steam heating the same. The various rolls 11 are driven in the usual manner by gears not illustrated, which rolls carry the paper web and cause the same to travel from the receiving end to the delivery end of the machine. In addition to the above, such other construction may be employed as becomes essential to the successful operation of the drying machine, which construction, however, forms no particular feature of the invention, and has not been shown in detail in this drawing.

For the purpose of my invention, one end of each of the drier rolls 11 is formed with a flange which may be constructed integral therewith, or which may be attached thereto in any suitable manner. When the flange is to be applied to the ordinary drier rolls, the construction shown in Fig. 2 may be used. For this purpose I employ a separate flange 49 which has issuing from it a sleeve-like portion 50 of the same outside diameter as the shell 45, which sleeve-like portion fits up against the head 46 to provide a flanged extension to the roll proper, indicated in its entirety at 51. This sleeve-like portion is formed with a number of inwardly extending lugs 52 adapted to become seated upon the head 46 and through which a corresponding number of bolts 47 may pass. In this manner said extension 51 may be rigidly bolted to the ends of the rolls 11. Around the various rolls 11 is threaded a relatively thin and narrow steel tape 16, which is provided at regular intervals throughout its length with (key) slots 17, each enlarged at one end, as at 18, and reduced at its other end, as at 19. This tape passes successively around the rolls 11, as shown in Fig. 1, and is held taut by occasional tape tighteners 14 of suitable construction arranged on the up-rights 12. Prior to passing over the receiving roll 20 of the paper drier, the tape 16 is caused to pass beneath two idlers 21 and 22, disposed upon the floor of the building in which the drier is situated. These idlers carry said tape from the last roll 23 of the drier to the forward portion of the machine. At this position, said tape further passes over an auxiliary roll 24, journaled in standards 25 and 26 seated upon the floor, which roll 24 causes the upper reach 27 of said belt to incline upwardly toward the receiving roll 20 in a proper angular relation thereto, to enable the paper web coming from the press rolls to the drying machine to be conveniently attached to the tape and carried thereby, as will presently become apparent.

The tape 16 may be shifted transversely along the rolls 11 so as to cause the same to travel in proximity to flanges 49 of said rolls, where it is out of the way of the paper web, or the same may be shifted inwardly to ride on zones of said rolls normally occupied by a margin of the paper web, so as to permit of readily attaching the leading end of a web to said tape, and cause said web to be threaded and fed around the various drier rolls of the drying machine. For accomplishing this purpose, I provide a threaded spindle 28 journaled for rotation in bearings 29 formed on the standards 25 and 26. This spindle carries a shifter fork 30, which slides upon a guide bar 31, the shifter fork being threaded to screw upon the threaded spindle 28 and arranged to en-

gage the tape 16, as shown in Fig. 4, so that when the spindle 28 is manually rotated by means of a crank 32 secured thereto, said tape 16 may be laterally shifted along the rolls 11 to travel any desired distance from the ends thereof, within the limits of the spindle 28 and roll 24.

For attaching the leading end of a paper web to the tape 16, I employ a leader 33 best illustrated in Figs. 2 and 5. This leader includes an attaching member 34 constructed of a strip of resilient sheet material substantially the same width as the tape 16. This attaching member is provided at one end with a headed stud 35 adapted to be inserted into the enlarged end 18 of any of the slots 17, and upon movement in a direction opposite to the travel of said tape 16 to become lodged in the narrowed portion 19 of the selected slot, and so rigidly held in place upon the tape 16. The other end of the attaching member 34 is formed with an eye 36 in which is inserted a sling 37 constructed of webbing or any other suitable flexible material, such as a rubberized fabric or a leather strap.

In using the invention the following procedure is adopted. The tape 16 under normal conditions, travels upon the roll extensions 51 in close proximity to the flanges 49 thereof. Whenever the paper web breaks or it becomes necessary to thread the same around the various drier rolls 11 of the drying machine A, the tape 16 is shifted inwardly on the rotating rolls 11 by means of the crank 32 until said tape reaches a position on said rolls normally ridden by the nearest marginal portion of the web. The leading end 38 of the paper web 39, a portion of which has been shown in Fig. 2, is crumpled and inserted through the sling 37 and the headed stud 35 of the leader 33 hooked into the nearest slot 17 in the tape 16. As the tape travels along, the paper web 39 is led by it and thereby automatically threaded over and around the successive rolls 11 until the leading end of the web arrives at the discharge end of the machine. Here, the web is detached from the leader 33 and said leader disengaged from the tape, the dried web passing on to cutters or other machinery employed. It will be noted that the tape 16 can be so shifted as to cause the paper web upon entering the drier to take exactly the same position as it would ordinarily take when traveling through the machine in its normal course. As soon as the leading end 38 of the web is well started along the rolls 11, the tape 16 may be moved laterally of said rolls 11 by means of the crank 32 and spindle 28, toward the flanges 49 to shift said tape to one side of the paper web. As soon as the tape reaches the flanges 49 it travels freely about the sleeve-like portions 50 of the roll extensions 51 without interference with the

paper web, being at all times available for the purpose of threading the drier, as hereinafore described.

The tape 16 used in threading the web through the machine, being of relatively thin material, permits, in some instances, of the tape remaining in feeding position on the rolls 11 of the machine. When the tape is shifted onto the roll extensions 51, the paper web travels through the machine untouched by said tape and free from any chance of being injured or disfigured by contact with the tape.

The invention is extremely simple and its effectiveness in use eliminates the hard and hazardous labor of the several men required for the threading of a drier, which men, though usually idle when the drier is functioning normally, are required always to be present to thread the machine in case the paper web breaks.

Changes in the specific form of my invention, as herein disclosed, may be made within the scope of what is claimed without departing from the spirit of my invention.

Having described my invention, what I claim as new and desire to protect by Letters Patent is:

1. In combination with the drier rolls of a drying machine, an endless tape extending around said rolls and a leader to which the leading end of a web to be dried is adapted to be attached, said leader being detachably applicable to said tape.

2. In combination with the drier rolls of a drying machine, a tape extending around said rolls and a leader comprising an attaching member, adapted to be detachably secured to said tape, and a flexible sling secured to said attaching member for the reception of the leading end of a paper web.

3. In combination with the drier rolls of a drying machine, a tape extending around said rolls, means for shifting said tape laterally of said rolls and means for attaching the leading end of a web to said tape.

4. In combination with the drier rolls of a drying machine, a tape extending around said rolls, an auxiliary roll positioned in advance of the receiving roll of the drying machine, said tape passing around said auxiliary roll, means for detachably securing the leading end of a web to said tape, and means adjacent the auxiliary roll for shifting the lower reach of said tape thereto along said roll.

5. A leader for attaching the leading end of a paper web to a feeding tape, comprising an attaching member, means formed on said attaching member for detachably securing said member to the threading tape, and a sling fastened to said attaching member for receiving the end of the paper web.

6. A feeding and threading device for drying machines, comprising an endless

tape adapted to travel around the drier rolls, said tape having a plurality of key slots formed therein at intervals throughout its length, and a leader comprising an attaching member having a headed stud for engagement selectively with each of said key slots, said attaching member being formed with an eye therein, and a flexible sling passed through said eye and adapted to receive the crumpled end of a paper web.

7. A feeding and threading device comprising an endless tape adapted to run over the web drying rolls of a paper drying machine, means for moving said tape laterally of said rolls into and out of the path of travel of a paper web thereon, and means for attaching the leading end of a paper web to said tape.

8. In combination with the drier rolls of a paper drying machine, a tape extending around said rolls, a mounting situated in advance of the receiving roll of the drying machine, an auxiliary roll journaled in said mounting, said tape passing around said auxiliary roll and to said receiving roll, a threaded spindle journaled in said mounting, a shifter fork carried by said spindle and movable along the same upon rotation thereof, and means for attaching the leading end of a paper web to said tape.

9. In combination with the drier rolls of a paper drying machine, a tape extending around said rolls, roll extensions at the ends of the rolls of the same diameter as said roll, and means for shifting the tape from the rolls to said extensions.

10. In combination with the drier rolls of a paper drying machine, a metallic tape extending around said rolls and formed with key slots at intervals therein, a leader adapted to receive and hold the end of a paper web, said leader including a resilient attaching member formed with a head thereon for swiveling engagement, selectively, with each of said key slots.

11. The method of threading a paper web to the rolls of a drying machine having a feeding tape running over said rolls, said method consisting in shifting the tape laterally on the rolls into the path thereon normally traveled by paper webs, then attaching the leading end of a web to said tape, and finally moving said tape out of said path at one point to cause the disposition of said tape at all points thereof out of said path.

12. The combination with the drier rolls of a drying machine, an endless tape extending around said rolls and shiftable laterally thereon, and a leader having a swiveling connection with said tape and serving to connect the leading end of a web to the tape.

13. In combination with the drier rolls of a drying machine, a tape extending around said rolls and formed in a plurality

of places uniformly spaced lengthwise of said tape to permit of the attachment thereto of the leading end of a web, and tightening devices co-operating with the tape, said tape being adapted to pass smoothly over said devices.

14. In combination with the drier rolls

of a drying machine, a tape extending around said rolls and formed at intervals to permit of the non-slipping attachment thereto of the leading end of a web. 10

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

LORENZO M. AVENSON.