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(54) CIGARETTE PAPER SPLICING APPARATUS

(71) We, MOLINS LIMITED, a British Company, of 2 Evelyn Street, Deptford, London SE8 5DH., do hereby declare the invention for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

This invention is concerned with web splicing. It is especially concerned with splicing (i.e., joining in any convenient way) webs of paper drawn from successive reels to form the wrapper of a cigarette or cigarette filter rod in a continuous rod making machine. Examples of earlier proposals are described in our British patent specifications Nos. 1,086,065, 1,161,781 and 1,345,701.

This invention is concerned particularly with the avoidance of waste. In some of our earlier proposals splicing is initiated when an arm bearing on the nearly spent reel indicates that very little paper is left on the reel. However, it has been found that a safety margin must be left in such an arrangement, and has resulted in wastage of paper.

A web splicing apparatus according to the present invention for joining the trailing end of a web on one reel (especially the paper web used as the cigarette wrapper in a continuous rod cigarette making machine) to the leading end of a web on a stand-by reel, comprises a web splicing device through which the web drawn from the in-use reel is arranged to pass; a movably mounted web guide, means supporting both said reels such that both of the webs pass on the same side of said guide with the in-use web nearest to and tensioned around the guide, before reaching the web splicing device; means for urging the web guide towards the in-use web; means for detecting movement of the web guide when tension is lost in the in-use web, indicating that the web is about to expire, and for there-upon initiating operation of the web splicing device to join the in-use web to the stand-by web; said supporting means including movable mounting means for supporting each reel so that each reel is movable between

a first position which is occupied by the stand-by reel when web splicing is about to take place and a second position which is occupied by the in-use reel when web splicing is about to take place; and means operable after splicing to move the reel that is in use after splicing from the first position to the second position, such movement having the effect of changing the path of the web so that the in-use web engages the guide member and thereby resets the guide member.

Apparatus according to this invention preferably includes a reservoir (e.g. as described in our British patent specification No. 1,086,065) and splicing takes place while both webs are stationary, during which time web for the continuously running rod making machine is drawn from the reservoir.

One example of web splicing apparatus according to this invention for splicing the paper web of a cigarette or cigarette filter rod making machine is shown diagrammatically in the accompanying drawing.

Figure 1 shows diagrammatically a web joining apparatus in which operation of the web joining device is initiated by a guide detecting a loss of tension in the in-use web.

As shown in the drawing, a web 60 is being drawn from an in-use reel 61. The web 60 passes around a guide roller 63 mounted on a lever 64 pivoted at 65. A spring 66 urges the lever in a clockwise direction about the pivot 65.

It will be seen that the web 60 passes around the guide roller 63 so that tension in the web urges the roller 63 to the right, thus tending to rotate the lever 64 in a counter-clockwise direction. As long as there is tension in the web 60, the lever 64 engages a switch 67. When tension is lost in the web 60, the lever rotates so as to disengage from the switch 67; this initiates operation of a web splicing device 68.

The web 60 is drawn through the web splicing device 68 by a driven roller 69 against which the web is pressed by a spring-loaded pinching roller 70. The web splicing device is basically as described in any one of the

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already-mentioned British patent specifications. That is to say, it includes a reservoir (not shown) into which the web passes after leaving the web splicing device and in which

web can accumulate so that each web joining operation can take place while the in-use web (as well as the stand-by web) is stationary.

Disengagement of the lever 64 from the switch 67 causes operation of a valve 71 which feeds air to a cylinder 72 which then expands to move the pinching roller 70 away from the drive roller 69, thus stopping the drive to the web 60. Deceleration of the web is further aided by a suction brake 68A which may remain in operation permanently to keep the web in tension through the web splicing device 68.

The stand-by reel 73 is mounted in position only after the diameter of the in-use reel 61 has been reduced to a level (as indicated by an arm 74 pivoted at 74A) which allows room for the reel 73.

Each reel is mounted on a slider 75 which is movable along a track 76. When a reel is first brought into use (i.e. immediately after a web-joining operation) it is in the position of the reel 73 and is subsequently moved along the track 76 to the position occupied by the reel 61 in Figure 3. As a result of this movement, the path of the web 60 (which previously produced little or no force on the guide roller 63) bends around the guide roller 63 so as to produce the required force on the guide roller as a result of the tension in the web. When the in-use reel is moved to the position occupied by the reel 61, the arm 74 is placed against the reel (as shown) and this operation prepares the circuit which will cause operation of the valve 71 when the lever 64 disengages from the switch 67.

WHAT WE CLAIM IS:—

1. A web splicing apparatus for joining the trailing end of a web on one reel (especially the paper web used as the cigarette wrapper in a continuous rod cigarette making machine) to the leading end of a web on a stand-by reel, comprising a web splicing device through which the web drawn from the in-use reel is arranged to pass; a movably mounted web guide, means supporting both said reels such that both of the webs pass on the same side of said guide with the in-use web nearest to and tensioned around the guide, before reaching the web splicing device; means for urging the web guide towards the in-use web; means for detecting movement of the web guide when tension is lost in the in-use

web, indicating that the web is about to expire; and for there-upon initiating operation of the web splicing device to join the in-use web to the stand-by web; said supporting means including movable mounting means for supporting each reel so that each reel is movable between a first position which is occupied by the stand-by reel when web splicing is about to take place and a second position which is occupied by the in-use reel when web splicing is about to take place, and means operable after splicing to move the reel that is in use after splicing from the first position to the second position, such movement having the effect of changing the path of the web so that the in-use web engages the guide member and thereby resets the guide member.

2. A web splicing apparatus according to claim 1 in which the web splicing device includes a web reservoir for accumulating web prior to operation of the web splicing device, which operation is arranged to occur while the webs are stationary.

3. A web splicing apparatus according to claim 1 or claim 2 including a buffer associated with the in-use reel, so that operation of the web splicing device following loss of tension in the web leaves unused a predetermined length of the trailing end portion of the in-use web.

4. A web splicing apparatus according to claim 3 in which the buffer capacity is adjustable whereby the predetermined length of unused web can be altered.

5. A web splicing apparatus according to any preceding claim wherein said detecting means comprises a switch which is spring-loaded so as to be actuated by movement of the web guide to disengage the drive to the web, when tension is lost in the web, the arrangement of the switch and the web guide being such that movement of the stand-by reel to the in-use position causes the web to engage the web guide and reset the switch to its original position.

6. A web splicing apparatus according to any preceding claim in which the reels are slidable between the said two positions.

7. Web splicing apparatus substantially as herein described with reference to the accompanying drawing.

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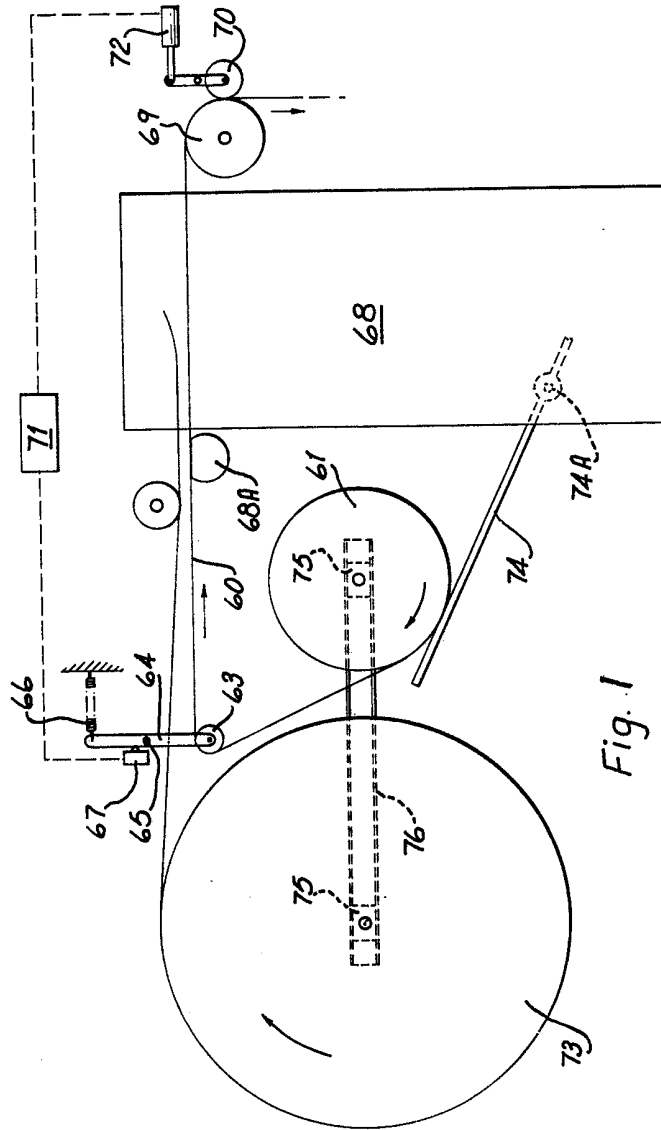


Fig. 1