

No. 841,994.

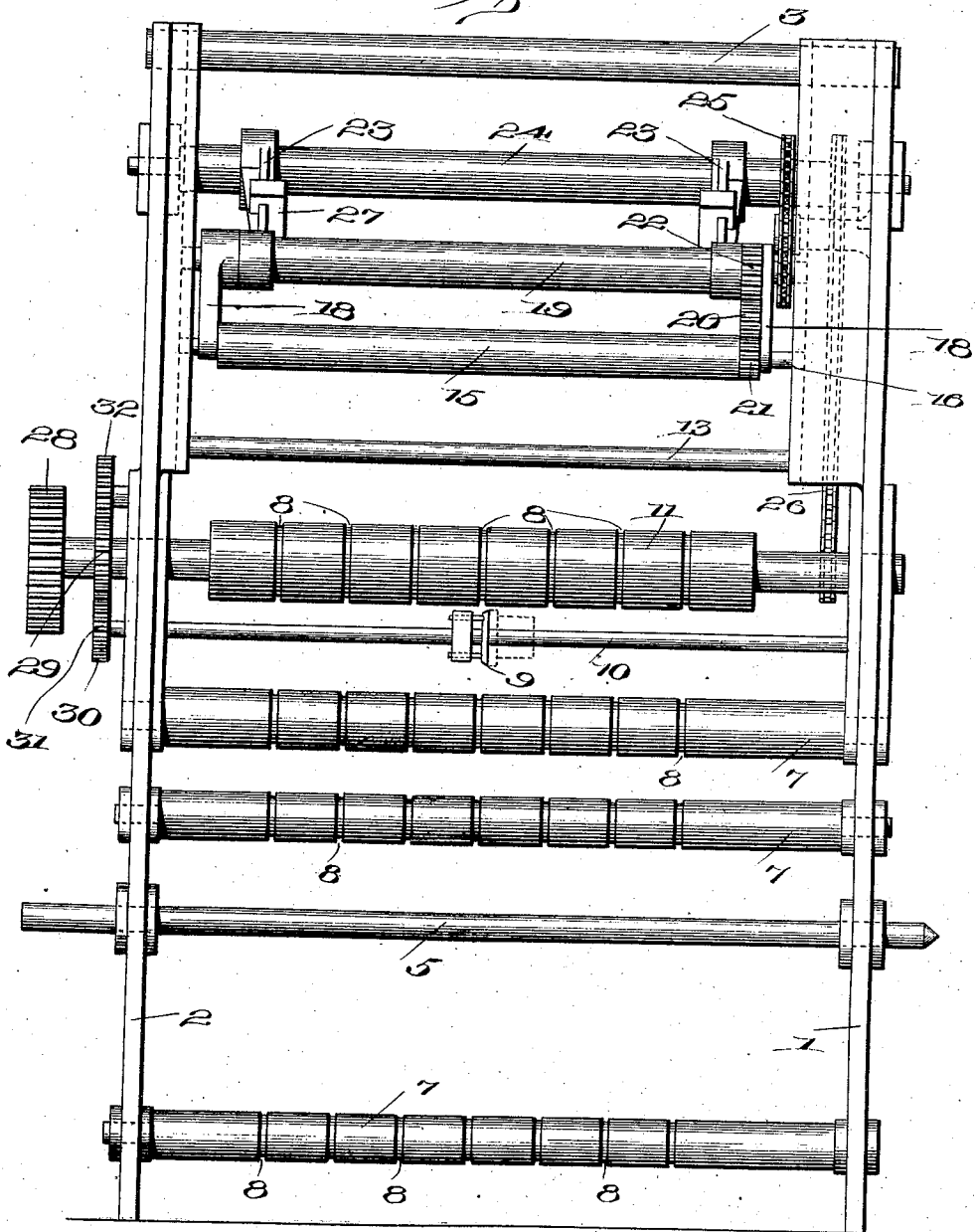
PATENTED JAN. 22, 1907.

R. MASON.
WEB GUIDE FOR REWINDING MACHINES, &c.

APPLICATION FILED JULY 16, 1903.

2 SHEETS—SHEET 1.

Fig. 7.



WITNESSES:

Allan Hoose
H. M. Seaman

INVENTOR:

Robert Mason
BY
Duell, Heynolds & Welford
ATTORNEYS

No. 841,994.

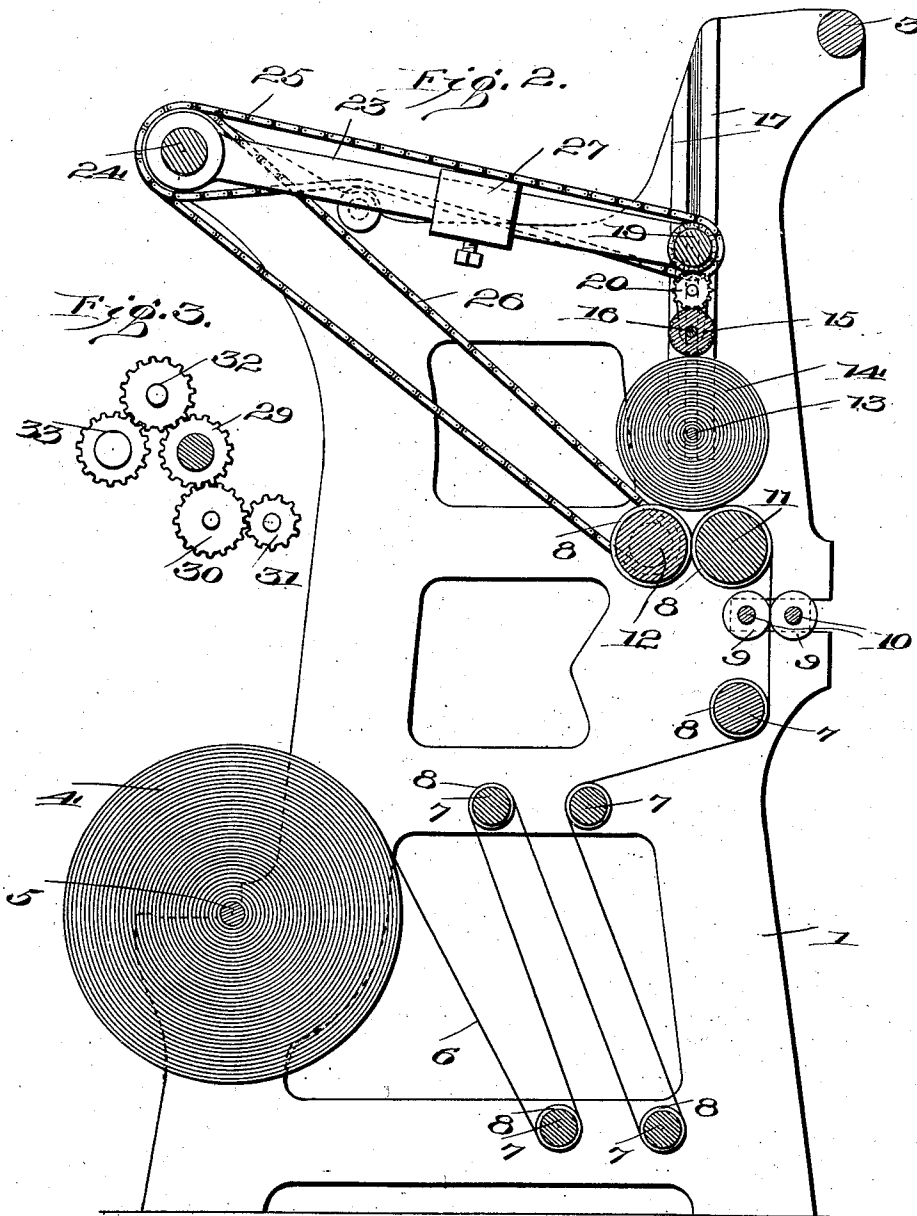
PATENTED JAN. 22, 1907.

R. MASON.

WEB GUIDE FOR REWINDING MACHINES, &c.

APPLICATION FILED JULY 16, 1903.

2 SHEETS—SHEET 2.



WITNESSES:

Allan Goose
H. M. Seaman

INVENTOR

Robert Mason

BY

Duell, Heynath & Warfield
ATTORNEYS

UNITED STATES PATENT OFFICE.

ROBERT MASON, OF DOVER, NEW HAMPSHIRE, ASSIGNOR TO KIDDER
PRESS COMPANY, OF DOVER, NEW HAMPSHIRE, A CORPORATION
OF WEST VIRGINIA.

WEB-GUIDE FOR REWINDING-MACHINES, &c.

No. 841,90

Specification of Letters Patent.

Patented Jan. 22, 1907.

Application filed July 16, 1903. Serial No. 165,790.

To all whom it may concern:

Be it known that I, ROBERT MASON, residing at Dover, in the county of Strafford and State of New Hampshire, have invented certain new and useful Improvements in Web-Guides for Rewinding-Machines, &c., of which the following is a full, clear, and exact description, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to a web-guide for rewinding-machines, &c.; and its object is to provide means for guiding and alining a traveling web, especially adapted for machines for rewinding paper or other fabric into rolls the ends of which it is desired to have even or approximately square with their axes, but capable of use in a variety of relations.

The invention comprises in general the interposition in the path of a traveling web of a guide-roller or rollers, which rollers have a circumferential groove or grooves at right angles to the axes thereof. As the web passes over such roller it is found that it is held to its normal right-line movement and is prevented from wandering sidewise, which would put an unequal tension on the web and cause it to become strained and wrinkled, if not torn.

Some of the advantages of the invention might be obtained also by the use of a rigid bar or rod of various cross-sectional areas as distinguished from a roller or idler shaft.

Such a web-guide may be used to advantage in any winding-machine where it is desired to wind the web compactly and in the form of a true cylinder upon the mandrel, and it is of especial advantage in machines which slit a wide roll of fabric into a number of narrower strips and then rewind upon the same mandrel into a number of narrow-faced rolls all of which must be perfectly even, compactly wound, and with each layer of fabric exactly superposed upon the one beneath.

With machines as heretofore proposed it has been found difficult to carry out this operation without interweaving the layers of adjacent rolls.

The present invention secures such an alinement of the parent web and of the separate webs into which it is divided that it is

possible to slit the web and rewind the strips upon one mandrel, while still retaining compact rolls of proper shape and with distinct planes of demarcation between the divisional rolls.

The invention is illustrated as applied to a machine for slitting and rewinding paper or other fabric of the type which rewinds by surface contact of the rewound roll upon two winding drums or rollers, which is generally known in the art and to the trade as a "surface winder."

Such a machine is shown in United States Letters Patent to Francis Meisel, No. 492,964, patented March 7, 1893, to which reference may be had for a fuller description of the details of the slitting and rewinding operation, only such features being shown and described as is necessary for a proper understanding of the application of the present invention.

In the drawings, Figure 1 is an end elevation of a slitting and rewinding machine constructed substantially in accordance with that disclosed in the patent noted above, showing the guide-rollers and winding drums or rollers grooved in accordance with my invention. Fig. 2 is a cross-section of Fig. 1. Fig. 3 is a detail showing a simple arrangement of gears by which the various shafts which it is necessary to actuate may be driven.

Similar reference characters refer to similar parts throughout the several views.

The machine, so far as it is here illustrated, comprises side standards 1 and 2, having a tie-bar 3 at the upper end thereof and otherwise connected and strengthened by the various cross-shafts. A delivery-roll is shown at 4, carried by a mandrel 5, loosely journaled upon the framework, and at suitable points in the path of the web 6 are interposed idler-rollers 7, one or more of which is provided with a plurality of circumferential grooves 8 at right angles to the longitudinal axis of the roller. From the last of these idler-rollers the web passes between cutter-heads 9 on cutter-shafts 10 and thence being cut by heads, as shown in the drawings, passes over the winding drums or rollers 11 and 12 to the rewinding core-shaft or mandrel 13, upon which it is rewound, as shown at 14. Resting on the upper side of the re-

wound roll 14 is the friction or pressure roller 15, trunnions on the ends of which, as at 16, are journaled in a slot formed between ways 17 on the framework, so that the position of the roller may be adjusted to suit the variations of diameter of the rewound roll.

Roller 15 is carried by links 18, depending from a shaft 19, journaled upon trunnions which are journaled in arms 23, the roller 15 being driven therefrom by means of idler 20, meshing with a gear 21 on the lower roller and a gear 22, which is fast to a chain-wheel, both running on the shaft 19. Shaft 19 is supported at the end of arms 23, securely fastened to a shaft 24, journaled at its ends in the standards. Gear 22, with its chain-wheel attached, are driven by means of a chain 25 passing over suitable sprockets on the shafts 19 and 24. Chain-wheels on shaft 24 are driven from the winding-drum 12 by chain 26 passing over suitable sprocket on the drum.

In order to adjust the pressure of the "friction" roller or shaft 15, such term being used interchangeably throughout, adjustable weights 27 may be provided in connection with the arms 23.

As shown in Figs. 1 and 3, a simple form of driving mechanism, for which any other adapted for special purposes might be substituted, comprises a driving-gear 28 on the end of the spindle of the winding-drum 11, a gear 29 on the same spindle being adapted to mesh with one of a pair of gears 30 31 upon the cutter-shafts 10 and with an idler 32, by which a gear 33 on the winding-drum 12 is driven.

Circumferential grooves are indicated at 8 as applied to each of the series of idler-rollers 7 and also to the winding-drums 11 and 12, although the grooving of certain of these elements may be dispensed with under certain circumstances or additional grooved elements added where it is found necessary.

The operation of the machine shown in the illustration will be readily understood by those skilled in the art and acquainted with the Patent No. 492,964 referred to, but may be briefly traced.

As the web in passing from the delivery-roll is drawn around the idler-rollers the grooves, it would appear, owing to the action of the edges thereof, which are at right angles or square with the axis, hold the web to a straight-line movement and prevent the injurious effects of wandering. The web is then delivered to the cutter-shafts in proper alinement, which alinement is further assured and completed by the action of the grooves upon the winding-drums 11 and 12, one or both, and it is then rewound upon the mandrel 13 owing to the frictional contact between the roller thereon, as shown at 14, and the winding-drums 11 and 12. The office of the friction roller or shaft 15 is to put proper tension upon the rewound roll in

order that there may be proper cooperation between such roll and the winding-drums. This friction-roller 15 may be driven in the manner shown or may be supported as an idler-roller.

It will be obvious that the character of the grooves in the idler-rollers and in the winding-drums may vary widely without departing from the scope of this invention.

In practice it has been found, that the grooves can be quite shallow, one thirty-second to one-sixteenth of an inch being ample in machines for slitting and rewinding paper, inasmuch as the feed of the groove in preventing the wandering of the web appears to depend in large measure upon the effect of the edge of the groove upon the web. The paper is usually cut in widths varying by even eighths of an inch, and it has been found desirable to space the grooves, so that with the different widths of rolls cut the edge of the paper will come somewhat close to the edge of the grooves. For this purpose grooves about one-sixteenth of an inch wide and one-sixteenth of an inch deep, leaving one-eighth of an inch land between—that is, three-sixteenths of an inch from center to center—work correctly.

I do not limit myself, however, to the width, depth, character, or number of the grooves employed; as the invention may obviously be embodied, so far as these and other elements of organization are concerned, in a variety of ways.

Having thus described the nature of my invention and the application thereof to one organization of the many for which it might be readily adapted, what I claim as new, and desire to secure by Letters Patent, is—

1. In a web-guide, in combination, means for feeding a web, and means for preserving the alinement thereof, said means comprising an idler-roller interposed in the path of travel of said web at right angles thereto and provided with a circumferential groove or grooves at right angles to its axis.
2. In a winding-machine, in combination, a winding-shaft upon which a web is adapted to be wound, and a guide-roller interposed in the path of travel of the web, said roller having a plurality of circumferential grooves therein at right angles to its axis, and being free from coating parts fitting said grooves.
3. In a winding-machine, in combination, a winding-shaft upon which a web is adapted to be wound, means interposed in the path of said web for slitting or dividing the web longitudinally and a roller interposed in the path of travel of said web having a circumferential groove therein at right angles to its axis, said roller being free from coating parts fitting said grooves.
4. In a winding-machine, in combination, a winding-shaft upon which a web is adapted to be wound, means interposed in the path of

said web for slitting or dividing the web longitudinally and a roller interposed in the path of travel of said web having a plurality of circumferential grooves therein at right angles to its axis, said roller being free from coating parts fitting said grooves.

5. In a machine for slitting and rewinding a web of paper or other fabric, in combination with the delivery-shaft and the rewinding-shaft, the means for slitting and dividing the web into narrower webs, and a winding-drum upon the outer surface of which the re-wound roll is adapted to rest and by which it is driven, said winding-drum having a circumferential groove or grooves in said outer surface, said grooves being parallel to the line of travel of the web and also being interposed between the edges of the cut portions of the same.

6. In a machine for slitting and rewinding a web of paper or other fabric, in combination with the delivery-shaft, the rewinding-shaft and a slitting means, an idler-roller interposed in the path of travel of the web between the delivery-shaft and the rewinding-shaft, said idler-roller having grooves therein which are parallel to the line of travel of the web.

7. In a machine for slitting and rewinding a web of paper or other fabric, in combination with the delivery-shaft and the means for slitting the web into a number of narrower webs, a circumferentially-grooved idler-roller located between the delivery-shaft and the slitting means and a circumferentially-grooved winding-drum upon which the re-wound roll rests and by which it is adapted to be driven.

8. In a machine of the class described, in combination, a supply-roll, cutting mechanism, and a guide-roller interposed between said mechanism and said supply-roll the surface of which is provided with a plurality of annular grooves substantially parallel to the direction of travel of material from said supply-roll over the same.

9. In a machine of the class described, in combination, a supply-roll, cutting mechanism, and an independent guide-roller interposed between said cutting mechanism and said supply-roll the surface of which is provided with a plurality of annular grooves substantially parallel to the direction of travel over the same of material from said supply-roll.

10. In a machine of the class described, in combination, a supply-roll, cutting mechanism, and an independent idler guide-roller interposed between said cutting mechanism and said supply-roll the surface of which is provided with a plurality of annular grooves substantially parallel to the direction of

travel over the same of material from said supply-roll.

11. In a machine of the class described, in combination, cutting mechanism, means adapted to supply a sheet of material thereto, and a roller over which the parts of said sheet pass from said cutting mechanism, that part of the surface of which over which each part of said sheet passes is grooved in a direction substantially parallel to the direction in which said material passes over the same.

12. In a machine of the class described, in combination, cutting mechanism, means adapted to supply a sheet of material thereto, and an independent roller over which the parts of said sheet pass from said cutting mechanism, the portions of the surface of which over which each part of said sheet passes are grooved in a direction substantially parallel to the direction in which said material passes over the same.

13. In a machine of the class described, in combination, a supply-roller, cutting mechanism, a guide-roller interposed between said cutting mechanism and said supply-roller the surface of which is provided with a plurality of annular grooves substantially parallel to the direction of travel of material from said supply-roller over the same, and a roller over which the parts of said sheet pass from said cutting mechanism, the portions of the surface of which over which each part of said sheet passes are grooved in a direction substantially parallel to the direction in which said material passes over the same.

14. In a machine of the class described, in combination, a supply-roller, cutting mechanism, an independent guide-roller interposed between said supply-roller and said cutting mechanism the surface of which is provided with a plurality of annular grooves substantially parallel to the direction in which material passes from said supply-roller over the same, and an independent roller over which the parts of said material pass from said cutting mechanism, the portions of the surface of which over which each part passes are grooved in a direction substantially parallel to the direction in which said material passes over the same.

15. In a machine of the class described, in combination, a supply-roller, a winding-roller, and a guide-roller interposed between the same the surface of which is grooved in a direction at right angles with the axis thereof.

In testimony whereof I affix my signature in the presence of two witnesses.

ROBERT MASON.

Witnesses:

LESLIE D. HAYES,
C. W. CARTLAND.