No. 749,971. PATENTED JAN. 19, 1904.

E. S. NORDHOFF.

RIBBON WINDING DEVICE.

APPLICATION FILED DEC. 1, 1902.

NO MODEL.

Fig. 1

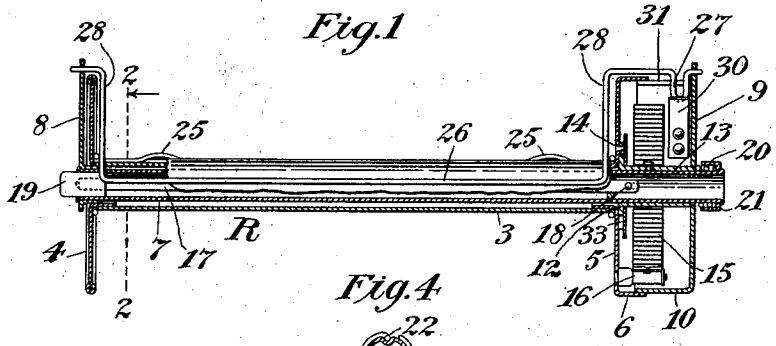


Fig. 4

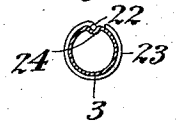


Fig. 2

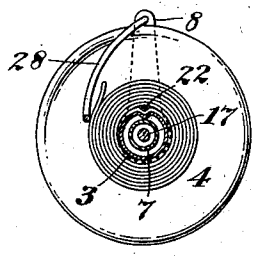


Fig. 3

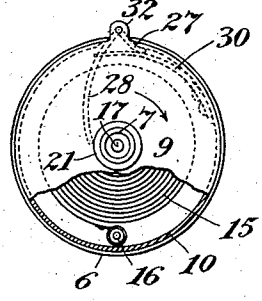


Fig. 5

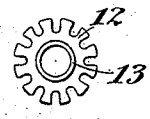
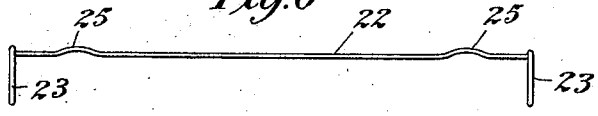


Fig. 6



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No. 749,971. Patented January 19, 1904.

UNITED STATES PATENT OFFICE.

ELSIE S. NORDHOFF, OF ALPINE, NEW JERSEY.

RIBBON-WINDING DEVICE.

SPECIFICATION forming part of Letters Patent No. 749,971, dated January 19, 1904.

Application filed December 1, 1902. Serial No. 133,445. (No model.)

To all whom it may concern:

Be it known that I, ELSIE S. NORDHOFF, a citizen of the United States, and a resident of Alpine, in the county of Bergen and State of New Jersey, have invented certain new and useful Improvements in Ribbon-Winding Devices, of which the following is a specification.

This invention relates to a ribbon-winding device; and its main object is to provide a simple and inexpensive device on which ribbons of various widths and lengths may be wound smoothly and evenly to prevent the wrinkling and creasing which result from putting them away haphazard, either folded or unfolded.

In order to wind one or more pieces of ribbon without loss of time, it is essential to provide some means for doing this work automatically; and one of the main features of my invention is a ribbon-reel controlled by a spring by means of which the reel may be turned any desired number of times when released and a corresponding length of ribbon wound on the reel.

In carrying my invention into effect I make use of a ribbon-reel mounted on a suitable support or frame and connect these two parts by means of a spring capable of rotating the reel the desired number of times, and in connection with these main elements I also provide devices for holding the inner end of the ribbon at the beginning of the winding operation and for gripping the outer end of the ribbon when the ribbon is completely wound to prevent unwinding, suitable means being also provided in connection with the reel and its support for preventing relative movement of the reel except when it is desired to wind a ribbon. When these parts are properly organized and the inner end of the ribbon is secured to the reel, the ribbon will be automatically wound up when the reel is released and allowed to turn freely on its support under the action of the spring, and when the outer end of the ribbon is pulled to unwind the same the spring will be wound up again to an extent corresponding to the amount of ribbon unwound, and hence will store sufficient power to permit the rewinding of the ribbon when desired.

In the drawings accompanying this specification and forming part of this application, Figure 1 is a sectional side elevation of a winding device constructed in accordance with my invention. Fig. 2 is a transverse section of the same, the section being taken in line 2 2, Fig. 1, looking in the direction of the arrow, this view illustrating the position of the device for holding a ribbon in place after it has been wound on the reel. Fig. 3 is an end elevation of the winding device with a part of the casing broken away. Fig. 4 is a sectional detail illustrating a spring-clip for securing the inner end of the ribbon to the reel. Fig. 5 is a detail of a detent-wheel for preventing rotation of the reel. Fig. 6 is a detail of the spring-clip for engaging the inner end of the ribbon.

The principal feature of my winding device is a reel which constitutes the outer element of the device, and on the outer unobstructed surface or spindle of this reel one or more ribbons may be wound, the number of ribbons which may be held by the reel varying, of course, in accordance with the length of the reel and the width of such ribbons. This reel may be of any suitable construction, but is preferably of the type indicated generally by R, it having in this case a tubular spindle 3 and a pair of end pieces or flanges 4 and 5. The end piece or flange 4 is in this construction a simple disk having a short central hub formed up therefrom to enter one end of the spindle 3 and be secured thereto, while the cap or flange 5 is similar to that shown at 4, except that it has a peripheral flange 6 for the purpose of forming one member of a casing in which the reel-rotating spring may be mounted.

Any suitable means may be employed for supporting the reel R for rotation, that shown herein being a simple frame consisting, essentially, of a tubular spindle 7, passing through the reel R and having suitable end pieces for handling the device and supporting various coöperating parts. At one end thereof this spindle has secured thereto an end piece, which may be in the form of an arm 8 for the purpose of supporting one end of the device by means of which the ribbon when wound is

held in place. At the opposite end of the spindle 7, adjacent the casing member 6, a complementary casing member 9 may be mounted, it being in this case in the form of a disk having a peripheral flange 10 of slightly smaller diameter than the flange 6 of the disk 5. The casing member 9 is fixed relatively to the spindle 7, so far as rotary movement is concerned, but in the construction shown may move longitudinally of said spindle. In this construction said casing member is fixed to the hub 13 of a toothed wheel 12, which coöperates with a complementary coupling member 14, carried by the disk 5 to hold the reel normally against rotation with respect to the spindle 7. The member 14 is here shown as a projection formed up from the metal of the disk 5 and is normally in locking engagement with one of the teeth of the wheel 12. When, however, said wheel 12 is shifted to the right, as seen in Fig. 1, a slight distance, said reel and its support are uncoupled, the casing member 9 moving with the wheel 12 and its hub, and the reel may now be turned automatically by its spring to wind up a ribbon.

Any suitable type of spring may be employed to turn the reel R; but I have illustrated herein a spiral spring or watch-spring 15, one end of which is connected to a post or stud 16, secured to the end 5 of the reel within the casing formed by said end piece and the member 9, while the inner end of the spring is connected to the inner tubular spindle 7. It being understood that this spring is partially wound up even when the reel is filled with ribbon, it will be seen that when the ribbon is drawn off and the reel thereby turned the spring will be put under greater tension, and this tension will be sufficient to automatically wind up the maximum length of ribbon when the reel is again released from its supporting-spindle. For the purpose of effecting this release of the reel I prefer to make use of a device by means of which the wheel 12 is released from the coupling member 14, and hence uncoupled from the reel. In the construction shown this releasing device is an uncoupling-rod 17, mounted to slide in the tubular spindle 7, and is connected, by means of a pin 18 passing through a slot in the tubular spindle 7, to the hub 13 of the wheel 12, which it operates. At its outer end said rod may have an enlarged head or button 19, by means of which the rod may be pushed in, while at the opposite end of the device a short coiled spring 20 may be interposed between the outer end of the sleeve 13 and the stop or cap 21 at the extreme end of the inner tubular spindle 7. By means of this spring it will be seen the wheel 12 and the uncoupling-rod 17, together with the casing member 9, will be returned to their normal positions when the button 19 is released. Thus the reel will always be normally locked to the spindle 7 to prevent rotation of the reel except when it is desired to wind a ribbon on the reel or remove it therefrom.

The holding means for engaging the ends of the ribbon may be of any suitable type. That employed by me for securing the inner end or ends of one or more ribbons to the body or spindle of the reel is shown herein as a wire clip having a holding portion 22 extending substantially from end to end of the reel and a pair of substantially circular end portions 23 adapted to encircle the ends of the spindle 3 of the reel and securely clasp the same. This wire therefore constitutes a spring-clip the bar portion 22 of which will hold firmly the ends of any ribbons which may be placed between it and the spindle 3. In order to assure a firm grip upon such ribbon and for the purpose also of enabling the ribbon to be wound smoothly, the spindle 3 is preferably grooved at 24 for the reception of the wire 22, and when in place said wire is substantially flush with the periphery of the spindle 3 and grips the ribbon in the manner shown in Fig. 2. In order to facilitate the insertion of the end of the ribbon under the bar 22, upwardly-bent portions 25 may be provided for engagement by the finger-nail, &c.

In order to hold the ribbon firmly in place when wound on the reel, it is desirable to make use of a holding device having a considerable range of action—that is to say, a device which will grip the ribbon firmly and exert a suitable tension thereon whether the reel is full or only partly filled. For the purpose of accomplishing this result I have illustrated herein a spring-pressed bail, which preferably consists of two parts, one of which is a bail proper and is suitably pivoted in the end pieces 8 and 9 of the supporting means, while the other is a separate spring coöperative with the bail in such a manner as to exert the proper tension on the bail when the latter is in its operative position, but so combined therewith as to permit the bail to be swung to an inoperative position when desired. This bail is designated generally by 26, and the ribbon-holding portion thereof extends substantially from end to end of the reel. At the casing end of the winding device this bail is shown as having a U-shaped bend 27, disposed at a suitable angle to the end portions 28 of the bail proper for the purpose of forming an angle-arm of short radius capable of coacting with a spring 30 and turning from an operative to an inoperative position, or vice versa, while in contact with such spring. This spring is secured to the inner side of the casing member 10, and the U-shaped bend 27 passes through a slot 31, formed in the flange 10, a portion of the metal removed to form such slot constituting an ear 32, in which the adjacent end of the bail-wire is pivoted.

In order to prevent interference of the teeth of the wheel 12 with the coils of the spring 15, a thin disk 33 of larger diameter that said

wheel is secured to the hub 13 at a point close to said teeth. The inner end of the rod 17 may also have a washer thereon for the purpose of guiding the same, as shown in Fig. 1.

From the foregoing description of my winding device it will be seen that I provide a simple, cheap, and effective means for quickly winding ribbons of different lengths and widths and storing them away, so that they will not be creased or wrinkled, it being merely necessary to insert the end of the ribbon or ribbons under the wire 22 of the spring-clip and push the button 19, when the ribbon will be wound up automatically, the button being released and the reel locked to the support again as soon as the ribbon is completely wound. During this winding operation the bail 26 may be shifted to its inoperative position in order to avoid unnecessary friction on the ribbon during winding. Before unwinding the ribbon said bail may also be swung to its inoperative position; but when the reel is put away with a ribbon or ribbons wound thereon the bail will be in the position shown in Fig. 2. In larger sizes this winding device may also be used to store thereon a large quantity of a single width of ribbon or of two or more narrow ribbons.

What I claim is—

1. In a ribbon-winding device, the combination with a tubular reel constituting the outer element of the device and having an exposed unobstructed spindle adapted to receive a ribbon, of a reel-supporting frame passing through said reel and on which the reel is rotatable, and a reel-rotating spring connecting said reel and frame.

2. In a ribbon-winding device, the combination with a reel constituting the outer element of the device and adapted to receive a ribbon, of reel-supporting means, a reel-rotating spring connecting said reel and the reel-supporting means, and a pair of ribbon-holding devices for engaging the inner end and the outer portion of a ribbon.

3. In a ribbon-winding device, the combination with a reel constituting the outer element of the device and adapted to receive a ribbon, of reel-supporting means, a reel-rotating spring connecting said reel and the reel-supporting means, and a pair of ribbon-holding devices one carried by the reel and the other by said reel-supporting means for engaging the inner end and the outer portion of a ribbon.

4. In a ribbon-winding device, the combination with a reel constituting the outer element of the device and having an exposed unobstructed spindle adapted to receive a ribbon, of reel-supporting means passing through said reel and on which the reel is rotatable, a reel-rotating spring connecting said reel and the reel-supporting means, and a spring-clip coöperative with the spindle of the reel for engaging the inner end of a ribbon.

5. In a ribbon-winding device, the combination with a reel constituting the outer element of the device and having an exposed unobstructed spindle adapted to receive a ribbon, of reel-supporting means passing through said reel and on which the reel is rotatable, a reel-rotating spring connecting said reel and the reel-supporting means, and a spring-clip surrounding the spindle of the reel for engaging the inner end of a ribbon.

6. In a ribbon-winding device, the combination with a reel constituting the outer element of the device and having an exposed unobstructed spindle adapted to receive a ribbon, of reel-supporting means passing through said reel and on which the reel is rotatable, a reel-rotating spring connecting said reel and the reel-supporting means, and a spring-clip surrounding and extending substantially from end to end of the spindle of the reel for engaging the inner end of a ribbon.

7. In a ribbon-winding device, the combination with a reel constituting the outer element of the device and having an exposed unobstructed spindle adapted to receive a ribbon, of reel-supporting means passing through said reel on which the reel is rotatable, a reel-rotating spring connecting said reel and the reel-supporting means, and a yielding holding device carried by said reel-supporting means for engaging the outer end of a ribbon.

8. In a ribbon-winding device, the combination with a reel constituting the outer element of the device and adapted to receive a ribbon, of reel-supporting means, a reel-rotating spring connecting said reel and the reel-supporting means, and a spring-pressed bail carried by said reel-supporting means for engaging the outer end of a ribbon.

9. In a ribbon-winding device, the combination with a reel constituting the outer element of the device and adapted to receive a ribbon, of reel-supporting means, a reel-rotating spring connecting said reel and the reel-supporting means, and a spring-pressed bail carried by said reel-supporting means for engaging the outer end of a ribbon and shiftable between two extreme positions in one of which it is inoperative.

10. In a ribbon-winding device, the combination with a reel constituting the outer element of the device and having an exposed unobstructed spindle adapted to receive a ribbon, of reel-supporting means passing through said reel and on which the reel is rotatable, a reel-rotating spring connecting said reel and the reel-supporting means, and means for holding and releasing said reel.

11. In a ribbon-winding device, the combination with a reel having an exposed unobstructed spindle adapted to receive a ribbon, of a reel-supporting frame forming with one end of said reel a casing located outside the plane of the reel, and a spiral spring mounted

in said casing and connecting said reel and frame.

12. In a ribbon-winding device, the combination with a tubular reel adapted to receive a ribbon, of a tubular spindle extending through said reel, a casing member carried by said spindle and forming with one end of the reel a closed casing, a spiral spring mounted in said casing and connecting said reel and spindle, means for coupling said reel and spindle, and an uncoupling-rod mounted to slide in said spindle.

Signed at New York city, in the county of New York and State of New York, this 17th day of November, A. D. 1902.

ELSIE S. NORDHOFF.

Witnesses:
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FREDK. P. FORSTER.