M. O. & J. G. REHFUSS.

PACKAGE TYING MACHINE.

APPLICATION FILED MAY 22, 1915.

1,183,235.

Patented May 16, 1916.

3 SHEETS—SHEET 1.

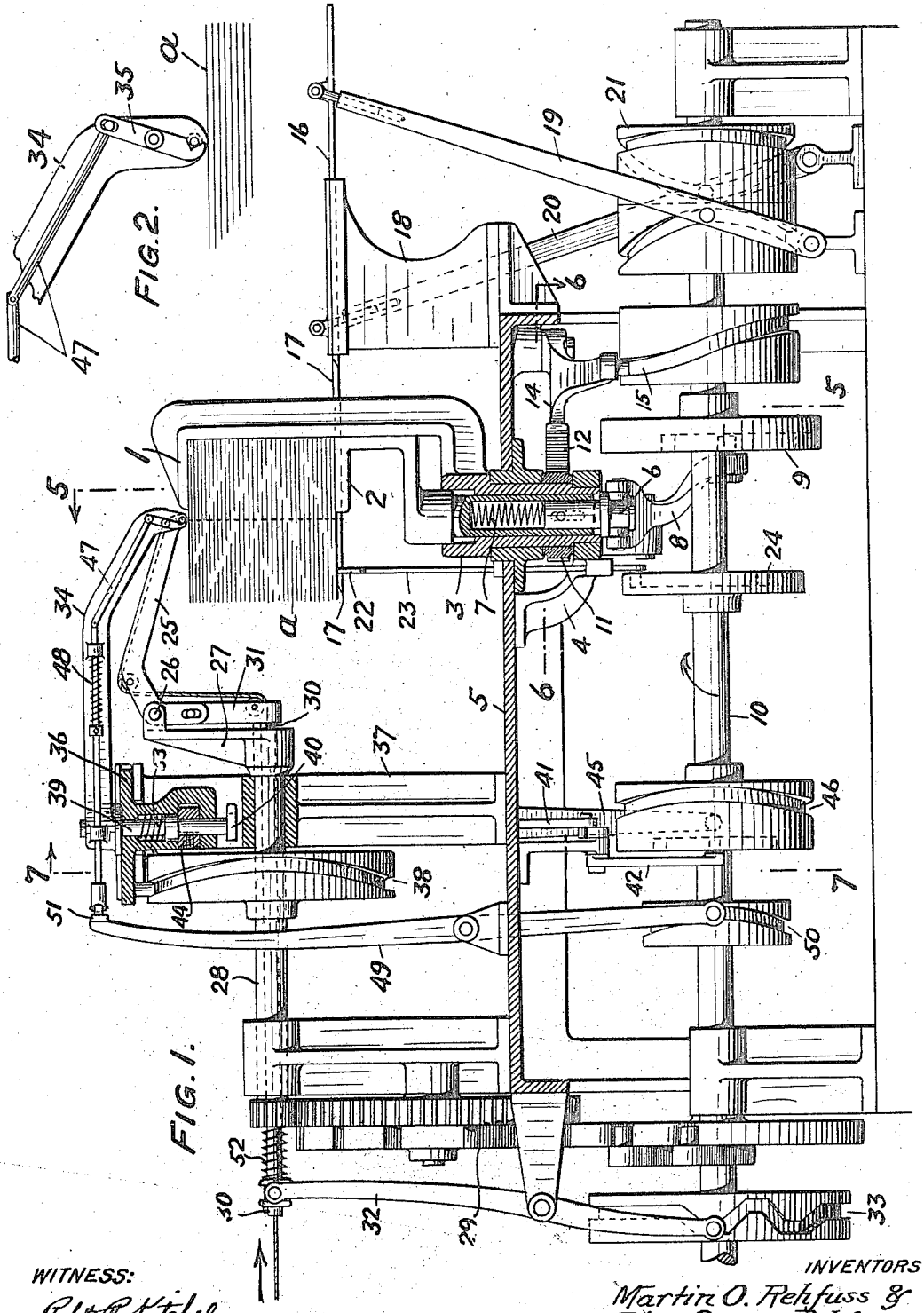


FIG. 1.

FIG. 2.

WITNESS:

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INVENTORS

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3 SHEETS—SHEET 2.

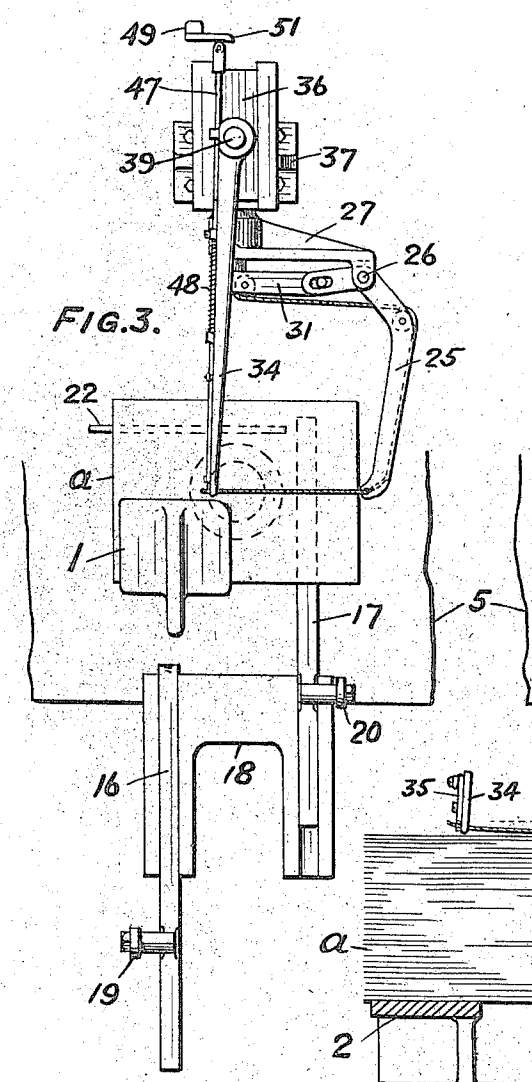


FIG. 3.

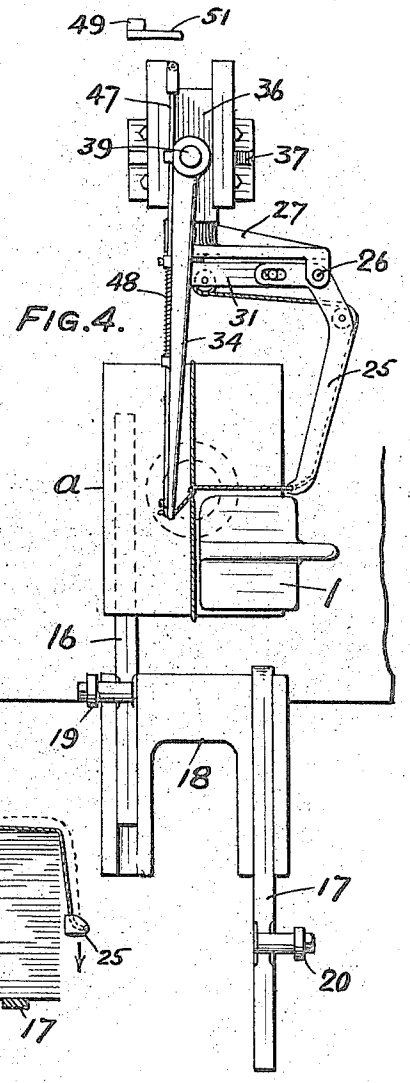


FIG. 4.

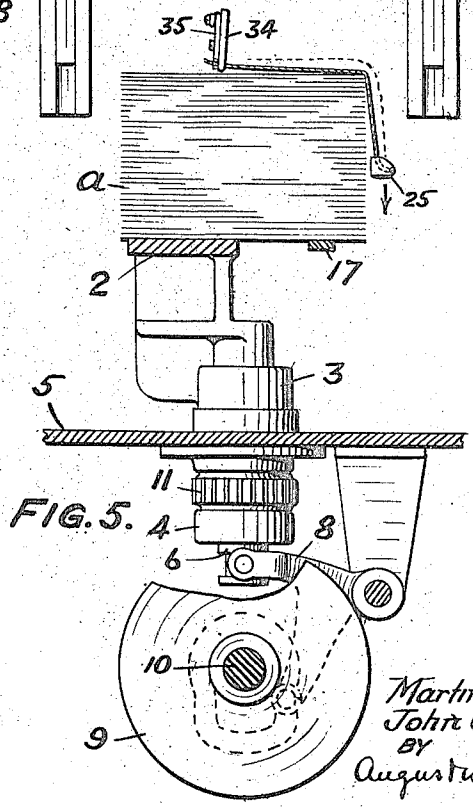


FIG. 5.

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3 SHEETS—SHEET 3.

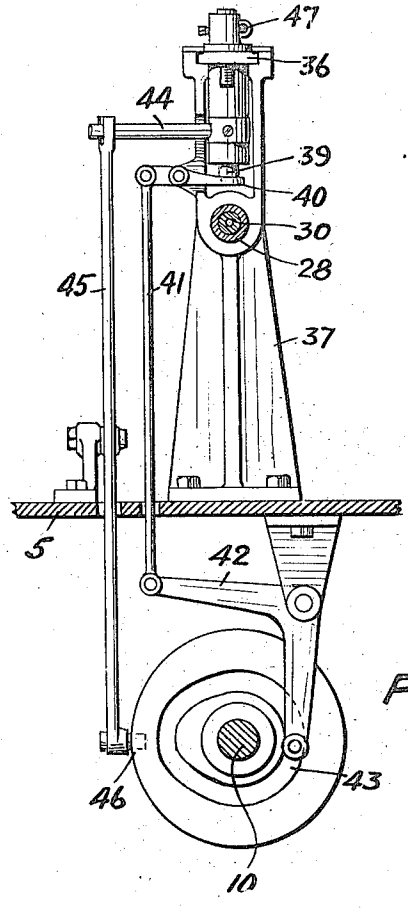


FIG. 7.

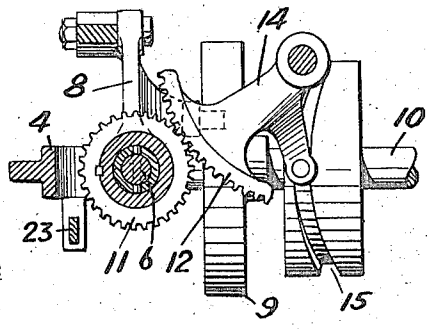


FIG. 6.

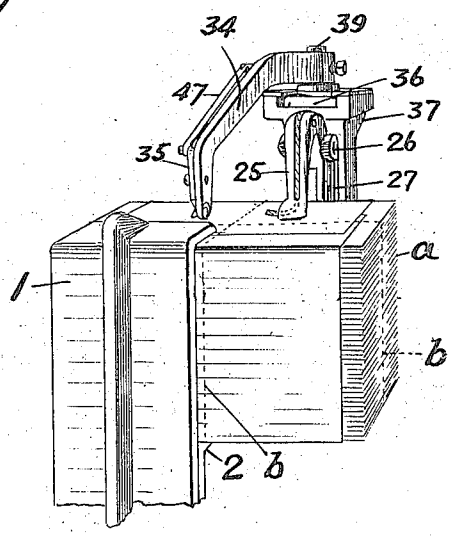


FIG. 8.

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UNITED STATES PATENT OFFICE.

MARTIN O. REHFUSS AND JOHN GEORGE REHFUSS, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNORS TO THE CURTIS PUBLISHING COMPANY, OF PHILADELPHIA, PENNSYLVANIA, A CORPORATION OF PENNSYLVANIA.

PACKAGE-TYING MACHINE.

1,183,235. Specification of Letters Patent. Patented May 16, 1916.

Application filed May 22, 1915. Serial No. 29,845.

To all whom it may concern:

Be it known that we, MARTIN O. REHFUSS and JOHN GEORGE REHFUSS, both citizens of the United States, and residents of Philadelphia, in the county of Philadelphia and State of Pennsylvania, have jointly invented certain new and useful Improvements in Package-Tying Machines, of which the following is a specification.

The present application is directed to features of construction shown in association with other parts of a complete machine in our application serially numbered 848,122 filed June 30th, 1914 as well as to improvements in those features, and the invention relates to mechanism for winding cord or twine in two directions around a package.

In United States Patent No. 858,206, of September 18th, 1900, to J. C. Collins, there is described a parcel tying machine in which a cord is caused to twice describe the same path and it is said that if it is desired to wrap the package both ways, instead of wrapping it twice around in one direction, the package is horizontally turned by hand one quarter around at the completion of one rotation of the cord, and in the latter position the twine is passed around the package at right angles with the first wrapping.

In United States Patent to Pickens, No. 904,223 of 1908, there is shown and described a means for turning the package to present it in two positions to the winding arm, as described above, but these Pickens' means comprise the combination of a turnable table and a non-turnable clamping jaw arranged to one side of the table, coöperating in such a way that the package is released every time it is turned, thus the articles constituting the package are free when the table is turned and although they are supposed to remain quiescent on the table still they are free and in the case of many articles will not remain quiescent but will move and get out of proper alinement.

The principal object of the present invention is to provide a new means for turning the package which avoid the above mentioned defects and disadvantages and which continuously hold the package or articles constituting it at all times until the winding is completed and even while the package is being turned. To this end our new means comprises the combination of concentrically mounted pivotal jaws which grasp the top and bottom of the package and continuously hold it until it is completely tied; the necessary table support being furnished by slidable rails arranged under the package.

Other objects of the present invention are to cause the winding arm to describe a path substantially parallel with and equi-distant from the faces of the package; to provide for properly repeating the winding operations, and to provide compact, reliable and efficient mechanism for properly winding twine around packages, such as piles of books or magazines in preparation for their transmission through the mails or otherwise.

The invention will be claimed at the end hereof, but will be first described in connection with the embodiment of it chosen for illustration in the accompanying drawings, in which—

Figure 1, is a side view, partly in section, of a machine embodying features of the invention. Fig. 2, is an enlarged detail view of certain of the parts shown in Fig. 1. Figs. 3 and 4 are top or plan views showing parts of the machine in different positions. Fig. 5, is a sectional view taken on the line 5—5 of Fig. 1. Fig. 6, is a sectional view, taken on the line 6—6 of Fig. 1. Fig. 7, is a sectional view, taken on the line 7—7 of Fig. 1, and Fig. 8, is a perspective view of certain of the parts illustrative of their operation.

A package *a*, such as a number of books or magazines, is to have a twine or cord passed around it in two directions, as indicated by the dotted lines *b* in Fig. 8, and the ends of the cord are to be crossed so that they can be secured, for example by means of a staple, although the stapling mechanism is not illustrated in this application. The package is inserted between the jaws 1 and 2, which are shown as duplicates of each other, in such a way that these jaws clamp between them the package at one corner part thereof. These jaws are turnable about a common axis. As shown they are carried by a head 3, turnable in bearings 4 in the frame 5 of the machine. The shank of the jaw 2 is movable endwise in the head 3, but both jaws turn with the head.

6, is a plunger having between it and the jaw 2, a spring 7. The plunger 6 is raised and lowered by a bell-crank 8, Fig. 5, operated upon by the groove of a cam 9 fast to

the shaft 10, so that the cam 9 operates upon the bell-crank in such a way that the jaw 2 clamps the package *a* while it is turned and while it is tied and then releases it. The spring 7 affords some give and take to accommodate variations in the package.

The head 3 is provided with a toothed-wheel 11, Fig. 6, meshing with a toothed sector 12 formed on a bell-crank 14, turned by a groove of the cam 15 fast on the shaft 10.

16 and 17 are rails slidable in ways on a bracket 18, carried by the frame 5, and they are inserted under and withdrawn clear of the package by means of followers 19 and 20, operated upon by the grooves of the cam 21 on the shaft 10, Fig. 1, so that one or the other of the rails underlies the package but their movement permits of rotation of the clamps 1 and 2.

22 is a rail movable up and down by its rod 23, which follows the groove of the cam 24 on the main shaft. This rail also serves to support the package.

25 is the winding arm and it is threaded as shown in Fig. 8. The threaded end of the winding arm traverses a path substantially parallel with and adjacent to the edges of the package, so that in the case of a rectangular package it traverses a rectangular path. This is accomplished by making the motion of the threaded end of the arm 25 the resultant of two motions, one rotary and the other rectilinear. The shank of the arm 25 is pivoted as at 26 to a crank 27 on the shaft 28, which is rotated at appropriate speed and with proper dwells from the shaft 10 by the gearing 29 which may include star wheels as well as toothed wheels. There is a spindle 30 arranged through the hollow shaft 28, so as to be endwise movable therein. One end of this spindle is provided with an arm 31 having slot and pin connection with the shank of the winding arm 25. The other end of this spindle 30 is operated upon by the follower 32 of the grooved cam 33 fast on the shaft 10. As the shaft 28 rotates it tends to impart circular motion to the end of the winding arm 25, but this circular motion is modified by the form of the groove in the cam 33 acting through the follower 32, spindle 30 and arm 31 upon the shank of the winding arm, so that the path described by the latter is as has been said, generally rectangular. The holding arm 34, Fig. 2, is provided with a holding finger 35. When a package is tied, the cord is cut and the package is removed. This leaves the end of the cord projecting from the arm 25 as shown in Fig. 8. This projecting end of the cord is inserted through an eye in the holding arm 34 and is held by the holding finger 35 during the operation of the winding arm. To accomplish this, as well as to permit of the passage of the winding arm and to position the cord as shown in Fig. 4, the end of the holding arm has three motions. The holding arm 34 is pivotally mounted upon a slide 36, Figs. 3 and 4, which is reciprocated in ways on a bracket 37, carried by the frame 5, by the groove in a cam 38 fast on the shaft 28. This causes the holding end of the arm 34 to be moved crosswise of the path of the end of the arm 25. The stud 39 which constitutes the pivot for the arm 34 can be raised and lowered by means of the lever 40 connected by a link 41 with one arm of the follower 42 of the grooved cam 43 fast on the shaft 10, Fig. 7. This raises and lowers the operative end of the arm 34 or moves it radially in respect to the path described by the threaded end of the arm 25. A turning motion parallel to the plane of the package is imparted to the operative end of the arm 34 by the radial pin 44 connected with the stud 39 and operated upon by the forked end of the lever 45, operated upon by a cam 46, Fig. 7. The holding finger 35 is connected with a system of links and levers 47, acted upon by a spring 48, to cause the holding finger to grasp the twine or cord and released by a lever 49, actuated by a cam 50 on the shaft 10, Fig. 1. This lever 49 is provided with a shoe 51, Figs. 3 and 4, which accords the arm 34 a range of motion without disengaging the mechanism 47 and the lever 49. Springs as 52 and 53 are shown and their purpose is to take up any lost motion. It may be said that with the exception of perhaps the spring 53 the parts are generally operated by grooved cams, hence their operation is positive and reliable.

The described mechanism is so timed and the described movements are so effected that the mode of operation can be explained as follows:—The arm 34 receives and holds the end of the cord, Fig. 3, and the arm 25 describes the path indicated in Fig. 5, until it goes around the package in one direction; meanwhile the slides 17, 16 and 22 are properly withdrawn and re-inserted to permit of this. The winding arm properly passes the holding arm which is withdrawn for this purpose out of the path of the winding arm and the package while continuously and firmly held between the jaws is turned, each of the jaws turning about the same axis for this purpose. This crosses the twine or cord, as shown in Fig. 4, and the winding arm then describes another turn around the package, the slides 17, 16 and 22 being properly operated as before. This completes the tying operation and the ends of the cord are secured by a staple or in any convenient way and the cord is cut. It will be understood that the jaws are separated from clamping position when the package is completed and will remain in clamping

position during the turning of the package and the application of the twine or cord.

It will be obvious to those skilled in the art to which the invention relates that modifications may be made in details of construction and arrangement without departing from the spirit of the invention, which is not to be limited in regard to those matters.

What we claim is:

1. In a package tying machine the combination of means for winding twine around twice in the same direction and concentric turnable means adapted to clamp the package in all positions thereof and to present and turn the same while clamped, whereby the twine is crossed and applied in two directions to the package.

2. In a package tying machine the combination of a pair of concentric clamping jaws turnable about a common axis and adapted to clamp a package while turning and of which the lower one is slidable in respect to the upper one, a winding arm adapted to pass twine around the package, and means for operating said parts including provisions for shifting the lower jaw in respect to the upper jaw.

3. In a package tying machine the combination of a pair of clamping jaws turnable about a common axis and adapted to clamp a package while turning, a winding arm adapted to pass twine around the package, movable rails for supporting the package and getting out of the way of the twine, and means for operating said parts.

4. In a package tying machine the combination of a turnable head having a pair of concentric clamping jaws, of which the shank of one operates as a side guide for the package, means for holding the jaws in clamping relation while the head is turning, a revoluble winding arm, and means for actuating said parts.

5. In a package tying machine the combination of a turnable head having a pair of clamping jaws, means for holding the jaws in clamping relation while the head is turning, a revoluble winding arm, movable rails for supporting the package, and means for actuating said parts.

6. In a package tying machine the combination of a winding arm having a twine carrying end, a revoluble element to which the arm is pivoted, a member for moving the arm axially in respect to the revoluble member, whereby the twine carrying end describes a path which is the component of the motion of rotation and of the axial motion, and means for operating said parts.

7. In a package tying machine the combination of a twine carrying arm, means for moving it, a twine holding arm and means for moving the holding arm into and out of the path of the winding arm both radially and laterally in two directions, substantially as described.

8. A package tying machine comprising the combination of clamping jaws each of which is turnable, means for maintaining the jaws in clamping position while they are turning, movable supporting rails, means for shifting them to clear moving parts of the machine, a winding arm, means for causing the winding arm to travel a path which is the resultant of rotary and rectilinear motion, a holding arm and means for moving the holding arm in three directions to clear the winding arm and to cross the cord and to catch the end of the cord, and means for operating said parts.

In testimony whereof we have hereunto signed our names.

MARTIN O. REHFUSS.
JOHN GEORGE REHFUSS.

Witnesses:
CLIFFORD K. CASSEL,
FRANK E. FRENCH.