GULIELMO COTTINI & GIROLAMO COTTINI.

TOILET PAPER MACHINE.

APPLICATION FILED JAN. 22, 1914.

1,104,415.

Patented July 21, 1914.

2 SHEETS—SHEET 1.

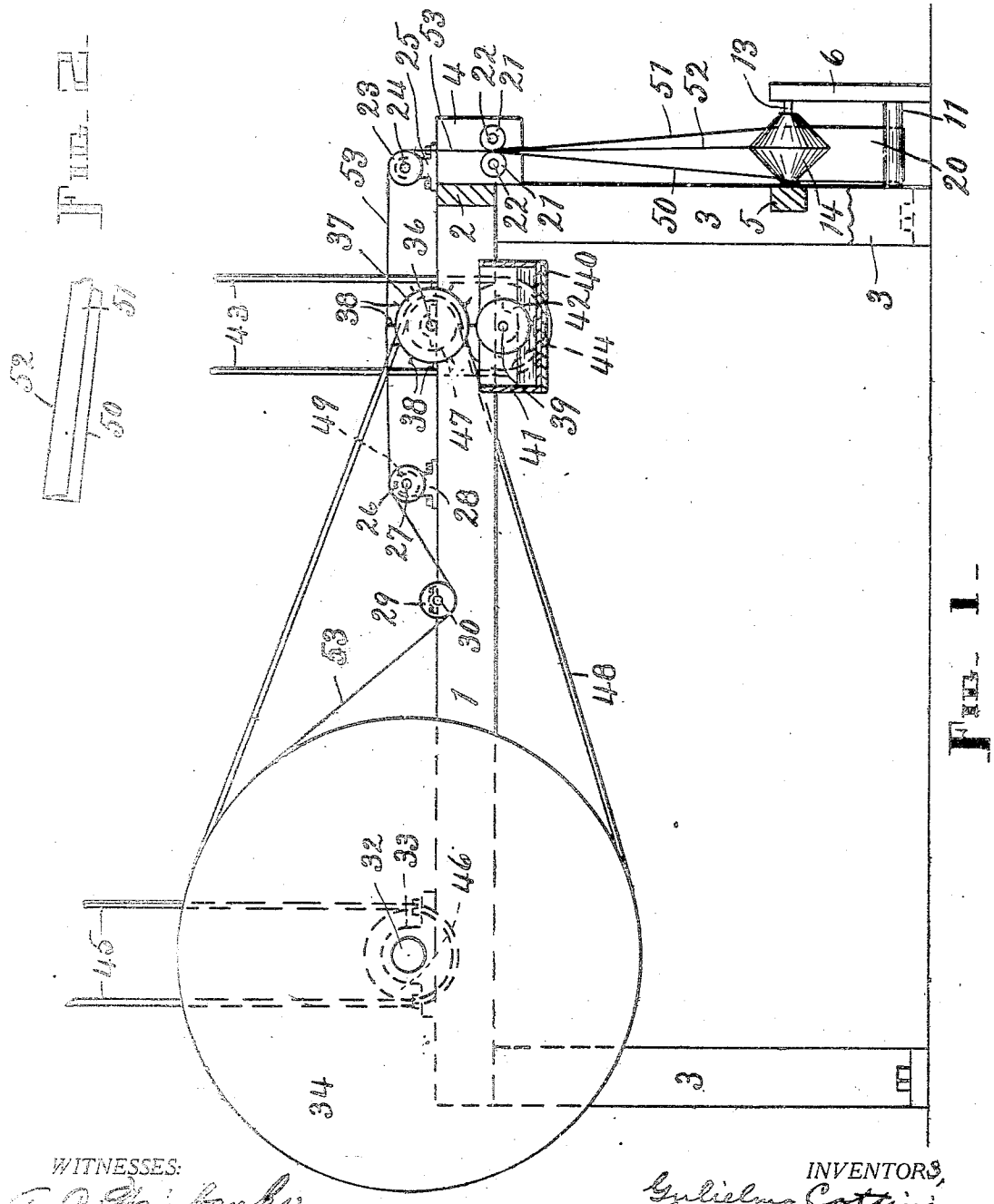


FIG. 1.

FIG. 2.

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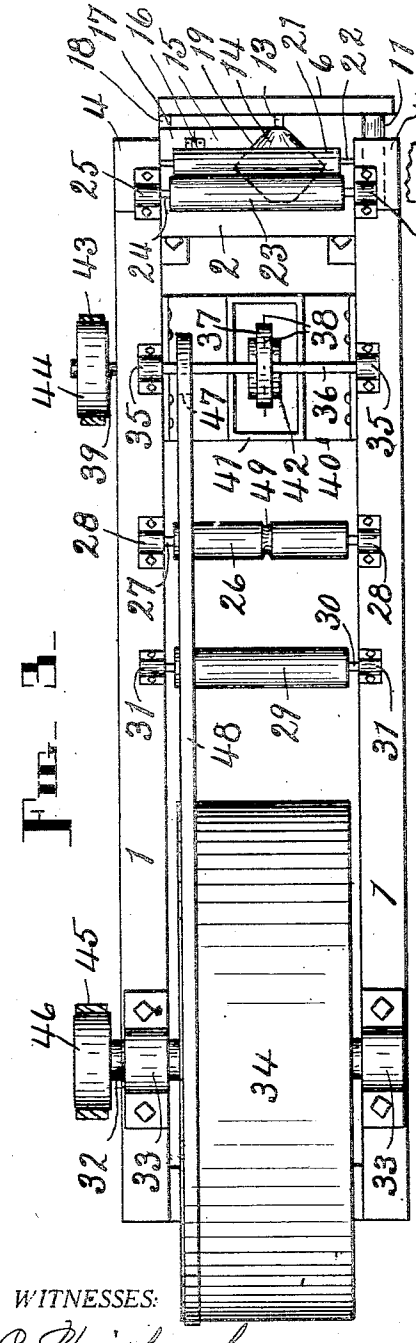


FIG. 3.

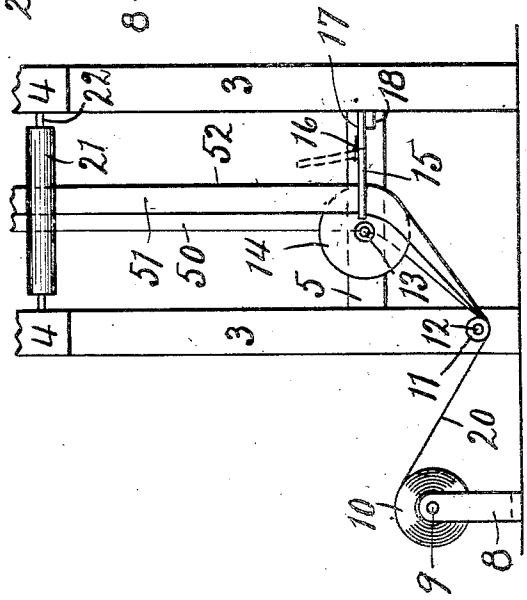


FIG. 5.

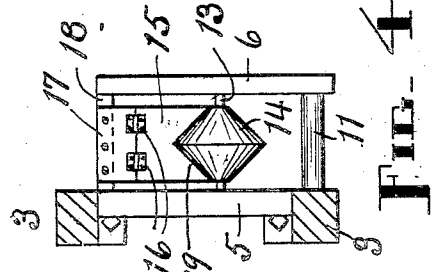


FIG. 4.

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TOILET-PAPER MACHINE.

1,104,415. Specification of Letters Patent. Patented July 21, 1914.

Application filed January 22, 1914. Serial No. 813,698.

To all whom it may concern:

Be it known that we, GULIELMO COTTINI and GIROLAMO COTTINI, both citizens of the United States of America, and residents of Springfield and Holyoke, respectively, in the county of Hampden and State of Massachusetts, have invented a new and useful Toilet-Paper Machine, of which the following is a specification.

Our invention relates to improvements in machines for preparing toilet paper and the like to make it ready to be cut and formed into bundles or packages, and consists essentially of certain peculiar mechanism for folding lengthwise a strip of paper, applying small particles or drops of adhesive material to such paper after being folded, and winding the paper thus prepared layer upon layer on a reel or drum, all as hereinafter set forth.

The primary object of our invention is to provide a machine wherewith may be economically and expeditiously produced toilet paper, folded and treated with an adhesive, in readiness to be cut into the proper widths for packages, which packages shall consist of folded sheets, with contiguous folds or laps of adjacent sheets attached by means of such adhesive, such a package, for example, as that which forms the subject matter of our application for United States Letters Patent filed on even date herewith and serially numbered 813,697.

A further object is to provide such a machine which is simple in construction and operation, comparatively inexpensive, and withal highly practicable and efficient.

Other objects and advantages will appear in the course of the following description.

A preferred form of embodiment of the invention, whereby we attain the objects and secure the advantages of the same, is illustrated in the accompanying drawings, and we will proceed to describe the invention with reference to said drawings, although it is to be understood that the form, construction, arrangement, etc., of the parts in various aspects are not material and may be modified without departure from the spirit of the invention.

In the drawings, in which like numerals designate like parts throughout the several views, Figure 1 is a side elevation in partial section of a machine which embodies our invention as aforesaid, the paper-feed roll and support being omitted, but the course of the paper through the machine, otherwise, being indicated by the presence, illustratively, of the paper strip; Fig. 2, a perspective view of an end portion of the paper strip after being folded by the machine; Fig. 3, a top plan of said machine, the paper strip being omitted except at the starting point; Fig. 4, a top plan of the folding mechanism or device, and, Fig. 5, a front end elevation of the machine or of certain of the parts and members at the front end, the folding plate being shown down in normal or operative position in full lines, and up in inoperative position by broken lines.

The main frame of the machine consists of a pair of side beams 1, a cross-piece 2 connecting the right-hand or front ends of said beams, and four legs 3. The beam 1, on what may be termed the front side of the machine or the side next to the beholder in Fig. 1, is omitted from said view, as also are the legs 3 on such side, with the exception of the bottom part of the right-hand one. Attached to the front end of the aforesaid frame, at the top, is a pair of bearing blocks 4. A cross-piece 5 is inserted between the front legs 3, and a vertical bearing support 6 rises from the floor oustide or to the right of the frame and adjacent to said legs. This support is omitted from Fig. 5. In advance of the vertical plane of the front side of the frame is a support 7 having a pair of vertical bearing arms 8. The support 7 rests on the floor and is clearly shown in Figs. 3 and 5.

A shaft 9, for a supply roll 10 is journaled in the arms 8. The supply roll 10 consists of a long strip of toilet paper wound into roll formation on the shaft 9.

Mounted on a shaft 11, which is journaled in the front leg 3, that is adjacent to the support 7, and in the support 6, is a guide roll 12. The shaft 11 is parallel with the shaft 9, but below the horizontal plane of said shaft 9.

Mounted on a shaft 13, which is journaled in the cross-piece 5 and the support 6, is a

folding roll 14. The roll 14 is in the form of a double cone having a common central base. Coöperating with or assisting the roll 14 in the folding operation is a folder plate 15. The plate 15 is hinged at 16 to a stationary plate 17 mounted on a bar 18 that extends between the cross-piece 5 and the upright 6. In the front or free end of the plate 15 is a V-shaped notch 19 through which the roll 14 revolves. The plate 15, when in operative position, is approximately in line with the horizontal plane of the axis of the roll 14. The hinges 16 afford means for turning the plate 15 upward and away from the roll 14, into the position shown by broken lines in Fig. 5, and for returning said plate to operative position relative to said roll. As will presently be more fully explained, the strip of paper from the roll 10, which strip is represented at 20, passes upward through the notch 19 in the plate 15, between the roll 14 and said plate, and in order that this action may occur without said plate being raised by the drag of said strip thereon, or, in other words, by the frictional contact of the paper with the edges of the notch 19, said hinges should have tight joints in the absence of special locking means. The weight of the plate 15 is also a factor in retaining it in operative position and resisting the upward tendency that the strip 20 would otherwise naturally impart to it. The shaft 13 is parallel with the shafts 11 and 9, but above the horizontal plane of the axis of either of the two latter.

A pair of contiguous creasing rollers 21 is mounted on a pair of shafts 22, which shafts are journaled in the bearing blocks 4, such rollers being above the folding roll 14 and arranged at right-angles to the herebefore-mentioned rotary members, including said roll. A guide roll 23 is mounted above the inner roller 21 on a shaft 24, which shaft 24 is journaled in bearings 25—25 secured to the upper contiguous edges of the blocks 4 and beams 1. The roller 23 is parallel with the rollers 21, as are all of the other rotary members yet to be described.

A guide roller 26 is mounted on a shaft 27 which is journaled in bearings 28—28 provided for said shaft on the beams 1. The axes of the rollers 23 and 26 are in the same horizontal plane, and said rollers are alike in diameter. Next in order from the front end of the machine is a guide roller 29 mounted on a shaft 30 which is journaled in bearings 31—31 on the beams 1. The roller 29 is situated below the horizontal plane of the rollers 23 and 26.

A shaft 32 is journaled in bearings 33 which are provided therefor on the beams 1 adjacent to their left-hand or front ends, and a winding drum 34 is mounted on said shaft.

Midway between the bearings 25 and 28 on each side of the frame is a bearing 35 on each beam 1, and journaled in the two bearings 35 is a shaft 36 having mounted thereon a pin-wheel 37. The wheel 37 is provided with a series of radial pins 38 that project from the periphery of said wheel and have a common vertical plane which is at right-angles to the wheel axis. The dimensions of the parts are such that the outer ends of the pins 38, as the wheel 37 revolves, pass slightly above, at the highest point of their revolution, the horizontal plane of the tops of the rollers 23 and 26, so that said pins in turn or one after another contact positively with the paper on the underside as it passes from said roller 23 to said roller 26.

Journaled directly below the shaft 36, in bearings on the undersides of the beams 1 and similar to the bearings 35, is a shaft 39. A bracket or hanger 40, which is attached at its ends to the inside faces of the beams 1, carries a box 41 which is designed to contain paste, gum, or other suitable adhesive material in liquid or semi-liquid form. The shaft 39 passes through the sides of the gum box 41, and a furnisher roll or gum roll 42 is mounted on said shaft in said box. The diameter of the roll 42 is such that the outer ends or heads of the pins 38 contact with said roll, as the wheel 37, revolves, and so receive thereon particles or drops of the gum or adhesive material, which particles or drops are transferred to the paper by said pins.

Power from any suitable source is transmitted to the gum-roll shaft 39 through the medium of a belt 43 and a pulley 44 on said shaft. Likewise power is transmitted to the drum shaft 32 through the medium of a belt 45 and a pulley 46 on said shaft, and to the pin-wheel shaft 36 by means of a pulley 47 on said last-mentioned shaft and a belt 48 which connects said last-mentioned pulley with the drum 34.

There is a groove 49 in the guide roller 26, in line with the pins 38, through which the drops of gum deposited on the paper by said pins pass. This provision prevents the gum on the paper from coming into contact with the roller 26 and so interfering with the successful operation of the machine.

In practice, the supply roll 10 is mounted on the shaft 9, and the strip 20 therefrom is led from the top of said roll beneath the guide roller 12, and thence upwardly behind the folding roll 14 and between said roll and the folder plate 15. The plate 15 is raised while the strip 20 is being first led up behind the roll 14, and then said plate is turned down again. In passing through the folder the strip 20 is folded lengthwise with a wide lap 50 and a narrow lap 51, as shown in Figs. 1, 2 and 5. The paper is creased at 52, Figs. 1, 2 and 5, by the rollers 22 to make the laps permanent. The folded strip is designated by

the numeral 53, and when such folded strip changes from its vertical to its generally horizontal course, the wide lap 50 is underneath and is the lap that receives the gum. Obviously the relative widths of the laps may be easily changed, by changing the position of the strip relative to the folder, but for the present purpose the arrangement of laps as herein shown and described is the one required. From the creasing rollers 22, the folded strip 53 passes up to and over the guide roller 23, then forward or to the left over the pin wheel 37 to the guide roller 26 and over the latter, then downwardly and forwardly under the guide roller 29, and finally upwardly and still forwardly to the top of the drum 34, to which drum the leading end of said strip is attached.

The operation of the machine is now as follows: The gum roll 42 is set in motion, so also is the drum 34. The pin wheel 37 revolves with the drum 34, as already explained. The paper is drawn forward by the drum 34, from the supply roll 10, through the folder and the creasing rollers, over the guide rollers 23 and 26 and under the guide roller 29, and wound on said drum, one layer upon another. The gum roll 42 revolves through the gum in the box 41, and so presents or furnishes constantly a fresh supply of gum to the ends of the pins 38 as they come into contact with said roll. Said pins in turn, as they carried around with the wheel 37, transfer the gum to the under side of the folded strip 53, during the passage of such strip over and in contact with said pins. In this manner and by this means drops of gum are deposited in a straight line but at intervals on the paper, and these deposits pass through the groove 49 in the guide roller 26, without coming into contact with said roller. As the strip 53 is wound on the drum 34 and one layer after another of such strip is superimposed on the preceding one, the drops of gum, which are adhering to the under side of the wide flap, come into contact with the upper side of the narrow lap below and adhere to the same also, thus sticking together at intervals the wide and narrow laps. When the layers of the folded strip wound on the drum 34 equal in thickness that of a package of the desired thickness, the drum is stopped, and such layers are cut across and removed therefrom, to be subsequently cut into package widths. At this time the strip 53 is severed between the guide roller 29 and the drum 34, and afterward the remaining severed end is drawn forward and attached to said drum, when the machine is ready to fold, gum and wind the paper for the next lot of packages. A portion of the paper, which is long enough to encircle the drum 34, should be kept free from gum and wound on said drum at the beginning of each run, so as to prevent the gum from coming into contact with said drum.

The gum roll 42 should not as a rule be stopped every time the drum 34 and pin wheel 37 are, but should be permitted to revolve constantly, if the gum in the box 41 is to be maintained in the best condition for use.

What we claim as our invention, and desire to secure by Letters Patent, is—

1. In a toilet paper machine, actuating means for a strip of paper, means to direct said strip in a generally horizontal direction, coöperating revoluble and stationary members to fold said strip lengthwise, said revoluble member changing the direction of said strip to an approximately vertical course, and means to change the direction of said strip to a generally horizontal course once more, but which latter course is approximately at right-angles to the original generally horizontal direction.

2. In a toilet paper machine, actuating means for a strip of paper, means to direct said strip in a generally horizontal direction, coöperating revoluble and stationary members to fold said strip lengthwise, said revoluble member changing the direction of said strip to an approximately vertical course, and means to crease and change the direction of said strip to a generally horizontal course once more, but which latter course is approximately at right-angles to the original generally horizontal direction.

3. The combination, in a toilet paper machine, with actuating means for a strip of paper, of a supporting member, a folder plate hinged at one end to said supporting member and having a V-shaped notch in the opposite end, and a folding roll mounted to revolve through said notch when said plate is in operative position.

4. The combination, in a toilet paper machine, with actuating means for a strip of paper, of folding means for such strip, such last-mentioned means comprising a folding roll in the form of double cones having a common base, and a folder plate notched to receive such roll, and means to permit said plate to be swung out of and into operative position relative to said roll.

5. The combination, in a toilet paper machine, with actuating means for a strip of paper, of a pair of guide members for such strip, a pin wheel located between said guide members and adjacent to a plane common thereto and to the strip guided thereby, the latter between said guide members being without support other than that afforded by said pin wheel, and means to supply an adhesive to the pins carried by said wheel.

6. The combination, in a toilet paper machine, with a winding drum and guide means for a strip of paper, of a folding roll and a folder plate to fold such strip lengthwise,

said plate being radial to the axis of said roll, creasing rollers for such folded strip, such rollers being approximately at right-angles to said folding-roll axis and approximately parallel with said plate, a pin wheel adjacent to the path of the folded strip at a point where such strip is otherwise unsupported, and means to supply an adhesive to the pins carried by such wheel.

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