April 25, 1933. S. J. CAMPBELL 1,905,899

METHOD OF PAPER FOLDING, WINDING AND CUTTING, AND MECHANISM THEREFOR

Filed Nov. 7, 1930 2 Sheets-Sheet 1

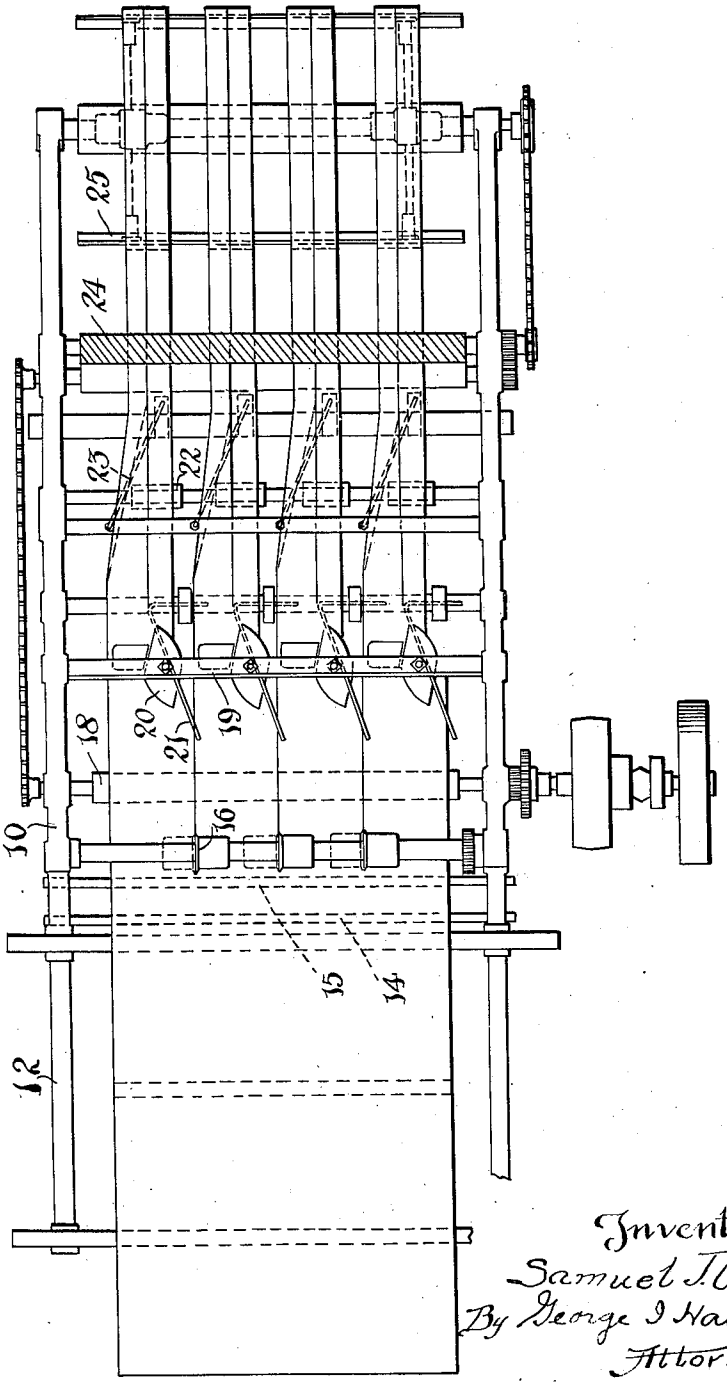


Fig. 1.

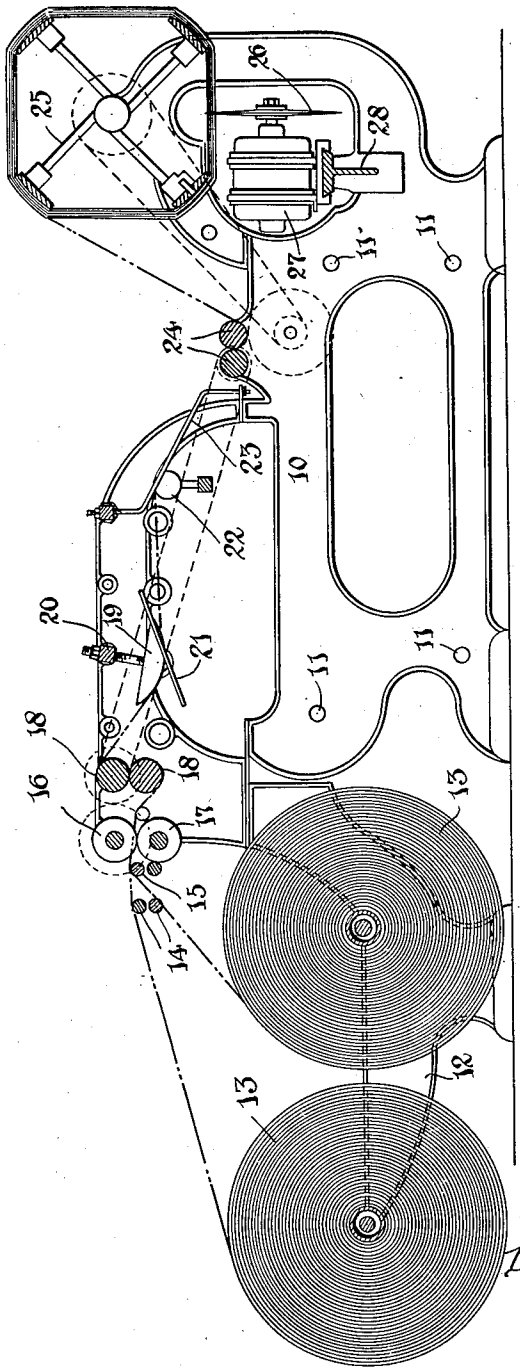
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Fig. 2.



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UNITED STATES PATENT OFFICE

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METHOD OF PAPER FOLDING, WINDING, AND CUTTING, AND MECHANISM THEREFOR

Application filed November 7, 1930. Serial No. 493,990.

This invention relates to improvements in method of paper folding, winding, and cutting, and mechanism therefor.

The method of the present invention is designed particularly for use in the folding, winding and cutting of paper napkins or towels or the like, and the characteristic feature of the present invention lies in the feeding of one or more paper webs from a continuous roll or rolls and in slitting the web or webs longitudinally into sections of the desired width and thereafter folding each of the sections longitudinally and delivering the folded sections in continuous form to a reel upon which the sections in folded form are wound and upon which they are cut transversely into lengths of the desired dimensions. This method of feeding, slitting, folding and cutting enables the work to be performed very rapidly and upon a machine of simple construction, and at the same time permits the cross-cutting to be performed while the continuous folded strips or sections are wound upon a reel so that it is not necessary to individually cut the sections and thereafter individually manipulate them, which effects a saving in time and simplifies the construction of the machine.

Further objects and details of the present invention will be apparent from a consideration of the method as exemplified in the operation of the machine illustrated in the accompanying drawings, wherein,—

Figure 1 is a plan view of the machine; and

Figure 2 is a side elevational view thereof.

The machine comprises a frame consisting of spaced side members 10, which are suitably connected by tie rods or the like 11, although the frame may be of any suitable and convenient construction.

Immediately adjacent the frame and at the rear end thereof is located a supplemental frame 12 which serves as a mounting for a pair of paper rolls 13 from which the paper webs are fed in superposed relation to one another. The paper webs from the respective rolls are fed over and under guide bars 14 and the united webs are fed over a guide bar 15 and under slitting discs 16 co-acting with rollers 17, which slit the web into sections. As illustrated in Figure 1, three slitters are employed for slitting the web in four longitudinal sections, each of which is subsequently folded longitudinally and delivered in the form of continuous individually folded strips to the reel.

After the slitting operation, the strips are fed under and over feed rolls 18 and each strip is then carried under a folding plate 19, which is adjustably suspended below a cross bar 20 and each folding plate is assisted by a diagonally disposed bar 21 which results in folding of the edge of the strip over the top of the strip as viewed in Figure 1. After each once-folded strip leaves the folding plate 19, it is carried over a guide roll 22 and around a diagonally disposed folding bar 23, which is properly positioned to fold the other edge of the strip under the body of the strip, which completes the folding and gives an S-folded relation to the strip although the arrangement of the folders may be changed or modified in a manner well understood in the art to bring both of the folds either above or below the body of the strip or, if desired, an additional longitudinal fold or folds may be imparted to the advancing strip.

After the strip has been folded in the manner described, it is fed over and under a pair of creasing rolls 24 and is thence led upwardly and around a reel 25 which may be a collapsible reel as shown, or a solid reel upon which the respective folded strips are wound up.

After the continuous strips have been wound upon the reel to the desired extent, the superimposed turns of each strip are severed into sections by the action of a rotating cutter 26 which is mounted upon the shaft of a motor 27, carried by a bracket 28 which may be raised and lowered as desired, suitable mechanism or appliances being provided for raising and lowering the motor and knife.

The slitters, feed rolls and reel are all driven by suitable power connections at a synchronized rate of speed but it is not

deemed necessary to describe such power-transmission connections in detail.

The paper webs from the two rolls are led forwardly and upwardly and united in superposed relation and as the webs advance they are slit into sections and thereafter the opposite edges of each section are folded inwardly and the section thus folded is wound upon the reel by a continuous operation until the individual strips, in the desired amounts, have been wound upon the reel. Thereupon the feeding of the paper is suspended and the rotating cutter or cutters are elevated to cut through the superposed turns or layers of the respective strips wound upon the reel which severs the material into the desired lengths. The sections thus severed will be removed from the reel, and thereafter the machine will be again started and the operation repeated. The method is one which obviates the necessity for providing cross cutters which are required to sever each section as it is delivered, and greatly simplifies the mechanism and operation and at the same time obviates the necessity for providing a mechanism for handling the severed sections individually, which in the case of tissue paper must be very carefully done.

Although the method of the present invention has been shown as practiced upon a machine of the character illustrated and described, it will be understood that the mechanism shown serves mainly for purposes of exemplification, and that it is not intended to limit the machine or method save in the manner set forth in the appended claims.

I claim:

1. The method of handling paper or the like which consists in feeding forwardly, and folding a strip of paper and winding the folded strip to afford a plurality of superposed folded turns in the winding, and in cross-cutting through the superposed windings to sever the folded strip into lengths.

2. The method of handling paper or the like which consists in continuously feeding forwardly a web of paper and longitudinally slitting the same into sections and in winding the sections to furnish a plurality of superposed turns in the winding and in thereafter cross-cutting the superposed turns of the windings to sever the same into lengths.

3. The method of handling paper or the like which consists in continuously feeding forward and winding a strip of paper to afford a plurality of superposed turns in the winding, stopping the winding when the desired number of turns have been laid in the winding and cross-cutting the superposed turns to sever the strip into sections of the desired length.

4. The method of handling paper or the like which consists in continuously feeding a strip of paper, inturning an edge thereof to form a fold, winding the continuous folded strip to provide superposed turns in said winding, and cross-cutting superposed turns to sever the strip into sections of the desired length.

5. The method of handling paper or the like which consists in feeding forward a continuous web of paper; slitting the web to form longitudinal strips and continuing the feeding, inturning an edge of each of the strips to form a longitudinal fold, winding the folded strips to afford a plurality of superposed turns thereof in the winding and cross-cutting the superposed turns to sever each strip into sections of the desired length.

6. In a machine of the class described, the combination of a framing, means for guiding and forwardly feeding a web of paper; a slitter for longitudinally dividing the paper web into sections, a folder for each of the sections for inturning an edge to afford a longitudinal fold, a reel upon which the folded paper strips are wound to afford a plurality of superposed turns, and a cutter adapted to cut through said superposed turns to sever the folded and wound strips into sections.

7. In a machine of the class described, the combination of a framing, means for guiding and forwardly feeding a web of paper; a slitter for longitudinally dividing the paper web into sections, a folder for each of the sections for inturning an edge to afford a longitudinal fold, a reel upon which the folded paper strips are wound to afford a plurality of superposed turns, and a rotary cutter adapted to be moved toward and from the reel to cut through the superposed turns of the folded strips wound upon the reel.

8. In a machine of the class described, the combination of a framing, means for mounting a paper roll upon the framing, means for feeding forwardly a strip of paper from the paper roll, means for inturning an edge of said paper strip to form a longitudinal fold therein, a reel for winding the folded paper strip thereon in the form of superposed turns and a cutter adapted to be moved to position to cut through the turns of the paper strip wound upon the reel to sever the same into lengths.

In witness that I claim the foregoing I have hereunto subscribed my name this 31st day of October, 1930.

SAMUEL J. CAMPBELL.