



# UNITED STATES PATENT OFFICE.

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## DEVICE FOR CONVEYING SHEETS OF PAPER.

SPECIFICATION forming part of Letters Patent No. 656,899, dated August 28, 1900.

Application filed April 20, 1900. Serial No. 13,616. (No model.)

*To all whom it may concern:*

Be it known that I, HOWARD K. KING, a citizen of the United States, residing in the city and county of Philadelphia, in the State of Pennsylvania, have invented certain new and useful Improvements in Devices for Conveying Sheets of Paper, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, of which—

Figure 1 is a plan view of part of a folding-machine in which my invention is embodied. Fig. 2 is a section as on line 2 2, Fig. 1.

This invention relates to the conveyance of sheets of paper or the like from one point or position to another by means of tapes and rollers.

The invention, broadly considered, consists, essentially, of the combination of endless driven tapes passing over two parallel rollers a desired distance apart and over a freely-rotatable roller (or rollers) intervening between and parallel with the first-mentioned rollers, the periphery of which intervening roller is in a plane above that of the said other rollers, together with a series of bars extending between the latter rollers, the upper surfaces of which bars are in a plane below and adjacent to that part of the said tapes lying between the said first-mentioned rollers, the construction being such, as hereinafter described, that a sheet fed in between the first roller and the tapes will be carried forward to the said intervening roller and between it and the said tapes and thence to the second of said rollers, the sheet being supported by the said bars on its way to and from the said intervening roller.

The invention relates, further, to certain combinations and details of construction hereinafter described and particularly pointed out.

The accompanying drawings, constituting a part of this specification, illustrate a form of my invention I have applied to a machine for folding sheets of paper wherein the sheets are conveyed by my device from the rollers that impart the final fold to the sheet into

position to descend into the usual packing-trough.

Referring to the said drawings, 1 is a part of the general frame of a folding-machine.

2 2<sup>a</sup> are the folding-rollers, between which the sheet is creased by the usual vibratory folding-blade 3. 4 4<sup>a</sup> show a second set of contiguous rollers, which are parallel with the folding-rollers and in the present instance overlie the packing-trough 5, Fig. 2.

6 6<sup>a</sup> are freely or independently rotatable rollers—two in this instance—that are journaled in bearings of end supports 7 in the interspace between the said folding-rollers and second set of rollers, which supports are secured to the frame of the machine. The upper part of the peripheries of these rollers 6 6<sup>a</sup> is, as seen in Fig. 2, in a plane above that of the corresponding parts of the peripheries of the other sets of rollers mentioned.

8 is a series of endless tapes that pass under the first roller 2 of the folding-rollers, over the second roller 2<sup>a</sup>, thence over the independent rollers 6 6<sup>a</sup>, thence over the roller 4 and under roller 4<sup>a</sup>, thence under and around a roller 9, returning over rollers 10. The latter rollers are mounted in brackets 11, that project forward from a cross-bar 12 of the frame of the machine, to which bar they (the brackets) are secured by means of bolts 13, passed through elongated slots 14 in said brackets for the purpose of longitudinal adjustment in order to effect a requisite tautness of the tapes 8, whereby the latter will be properly driven and bear against the independent rollers 6 6<sup>a</sup>.

The folding-rollers are driven in any suitable manner—as, for example, from a shaft 15, itself driven from the main shaft 16 of the folding-machine, the said shaft 15 carrying a bevel-gear 17, that engages a similar gear 18 on the shaft of one, 2<sup>a</sup>, of the said rollers, these rollers being geared together in the usual way. The set of rollers 4 4<sup>a</sup> are geared together and are driven from the same shaft 15 through a bevel-gear 19 on the end of the latter, that engages a like gear 20 on the end of the shaft of roller 9, upon which is a gear

21, that engages an idler-gear 22, which idler-gear also engages a gear 23 on roller 4<sup>a</sup>, that engages a similar gear on roller 4.

24 is a series of bars that are mounted on a shaft or bar 25, which in this instance is secured to the before-mentioned supports 7. These bars span the space between the roller 2<sup>a</sup> of the folding-rollers and the roller 4, the upper surface of the bars being, as seen in Fig. 2, in a plane a short distance below that part of the tapes 8. Preferably, for a reason hereinafter appearing, the ends of the bars contiguous to the roller 2<sup>a</sup> are respectively entered into grooves 26 in the latter.

Having thus described the construction of my invention, I shall now proceed to describe the mode of operation of the same, as follows: The sheet to be folded having been brought by tapes 27 or other suitable devices into proper position beneath the folding-rollers 2 2<sup>a</sup>, it is creased into the bite of said rollers, or rather, in this instance, first into the slot of the usual plate 28, Fig. 2, underlying the said rollers. Thence it passes on beneath the tapes 8 and upon the part of the bars 24 extending between the roller 2<sup>a</sup> and the independent rollers 6, thence between the tapes and the latter rollers over the other independent rollers 6<sup>a</sup>, thence over the roller 4 between it and the tapes, whence it descends into the packing-trough 5.

The ends of the bars 24 adjacent to the folding-roller 2<sup>a</sup>, extending into the grooves 26 in the latter to a point directly below where the tapes leave said roller, prevent liability of the end of the sheet from catching on the end of the bars.

It will be obvious that the distance between the point where the tapes leave the folding-roller 2<sup>a</sup> and the point of contact of the tapes with the rollers 6 should be less than the length of the folded sheet. Otherwise the sheet would not reach the said point, and thus would not be carried forward. It will be equally obvious that for a similar reason the distance between the point where the tapes bear on the rollers 6<sup>a</sup> and the point where the said tapes first reach the roller 4 should also be less than the width of the folded sheet.

The roller 4<sup>a</sup> may be sometimes dispensed with, in which case the roller 4 may be positively driven by suitable connections with the main shaft of the machine and the tapes 8 returned to the first one, 2, of the folding-rollers by properly-disposed rollers, over which the tapes pass.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. The combination of two parallel rollers, a suitable distance apart, a freely-rotatable roller intervening between said rollers and having the upper part of its periphery in a plane above that of the said rollers, the series of driven tapes passing over said several rollers, together with the series of bars extending between the said first-mentioned rollers, and adjacent to and in a plane below that of the said tapes, substantially as and for the purpose set forth.

2. The combination of a set of contiguous rollers, a positively-driven roller parallel with and in advance of said rollers, freely-rotatable rollers located between the first-mentioned rollers and said positively-driven roller, and with the upper part of their peripheries in a plane above that of the upper part of the peripheries of said other rollers, the tapes arranged with relation to said several rollers respectively, substantially as shown and described, and the bars in a plane below and adjacent to that part of said tapes between said contiguous rollers and said positively-driven roller, substantially as and for the purpose set forth.

3. The combination of the set of contiguous folding-rollers, the set of contiguous positively-driven rollers parallel with and in advance of the said first set, the freely-rotatable rollers located between the said two sets of rollers, and having the upper part of their peripheries in a plane above that of the corresponding part of the peripheries of said two sets of rollers, the series of driven tapes passing under the first roller of the set of folding-rollers, over the second one of said rollers, over and upon the said freely-rotatable rollers, over the first one of said set of positively-driven rollers, and under the second one of the last-mentioned set, together with the bars extending from the second one of the folding-rollers to the first one of the said positively-driven rollers, in a plane below and adjacent to that of the said tapes, substantially as and for the purpose set forth.

In testimony whereof I have hereunto affixed my signature this 16th day of April, A. D. 1900.

HOWARD K. KING.

Witnesses:

WM. D. YARNALL,  
WALTER C. PUSEY.