

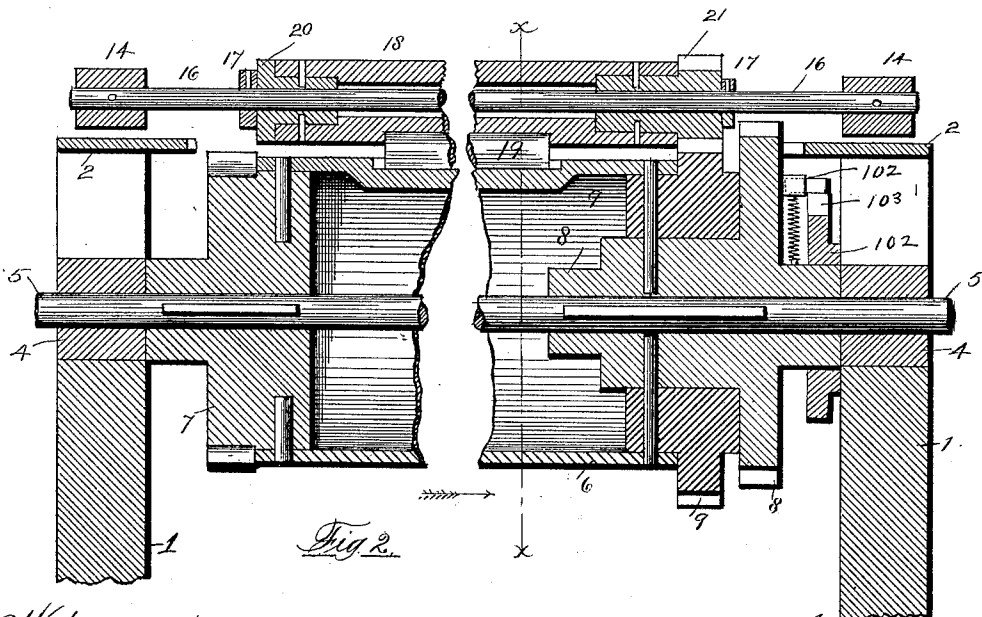
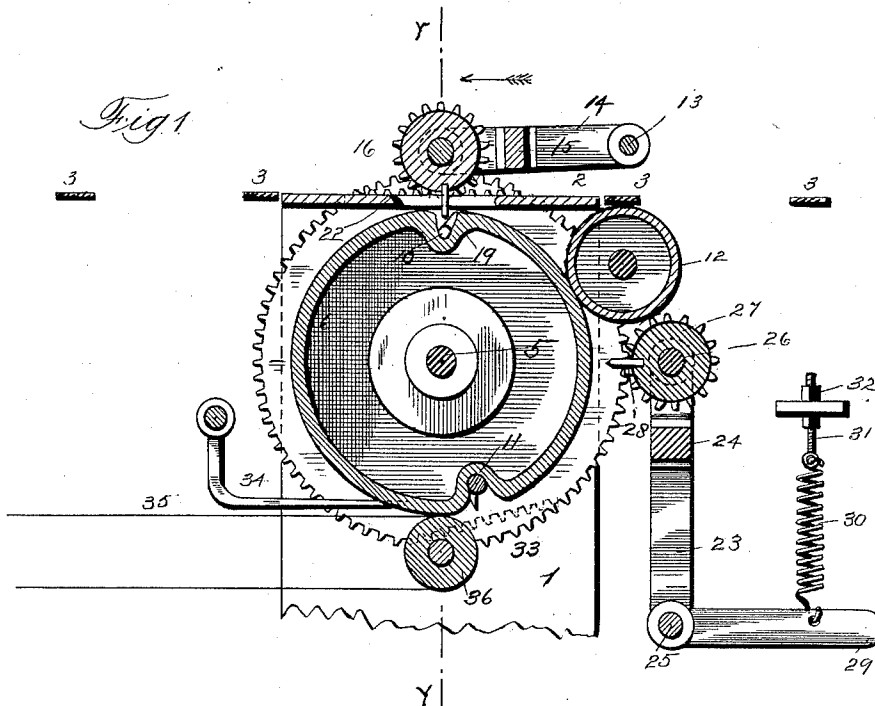
(No Model.)

3 Sheets—Sheet 1.

J. H. STONEMETZ.
PAPER FOLDING MACHINE.

No. 465,636.

Patented Dec. 22, 1891.



Witnesses
Walter S. Brown
Herbert M. Folsch

By his Attorney

Inventor
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Louis W. Southgate

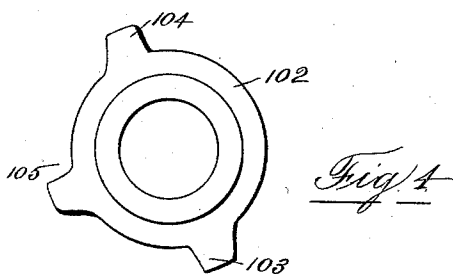
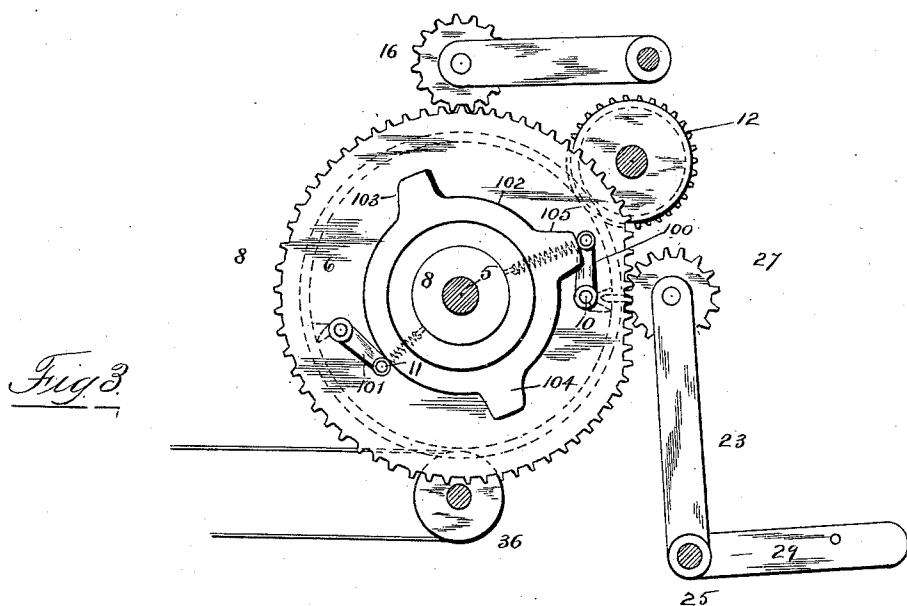
(No Model.)

3 Sheets—Sheet 2.

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(No Model.)

3 Sheets—Sheet 3.

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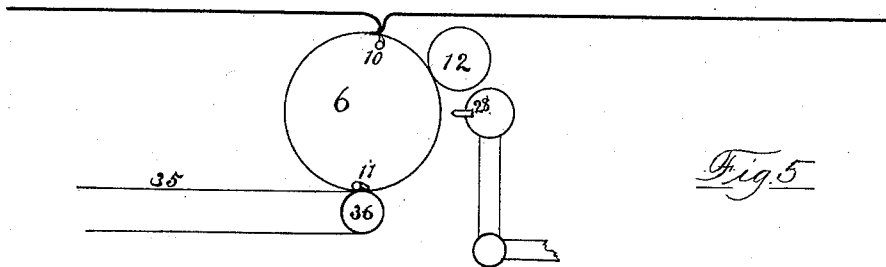
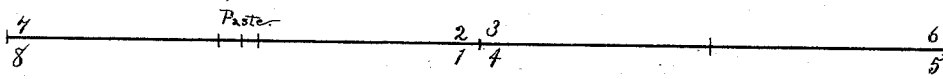


Fig. 5

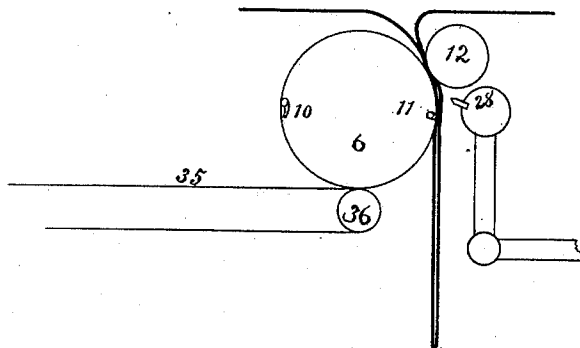


Fig. 6

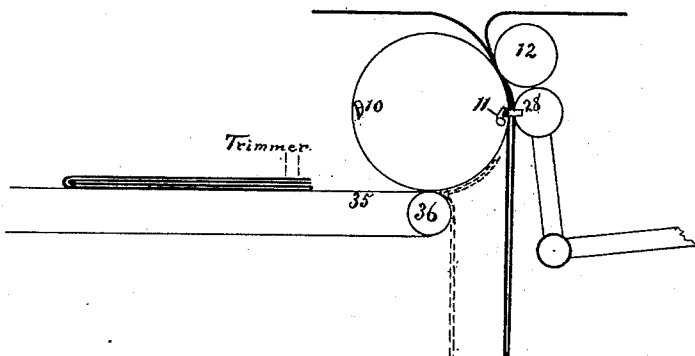


Fig. 7

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UNITED STATES PATENT OFFICE.

JOHN H. STONEMETZ, OF MILLBURY, MASSACHUSETTS, ASSIGNOR TO THE
STONEMETZ PRINTERS MACHINERY COMPANY, OF SAME PLACE.

PAPER-FOLDING MACHINE.

SPECIFICATION forming part of Letters Patent No. 465,636, dated December 22, 1891.

Application filed June 29, 1891. Serial No. 397,855. (No model.)

To all whom it may concern:

Be it known that I, JOHN H. STONEMETZ, a citizen of the United States, residing at Millbury, in the county of Worcester and State of Massachusetts, have invented a new and useful Improvement in Paper-Folding Machines, of which the following is a specification.

This invention has for its object to produce an improved tucker mechanism and a compact folding-machine by which a four, six, or eight page paper can be folded in the same machine.

To this end the invention consists of the device described and claimed in this specification and illustrated in the accompanying drawings, which show enough of the machine to illustrate my invention.

Referring to said drawings, Figure 1 is a section taken on line *xx* of Fig. 2. Fig. 2 is a section taken on *yy* of Fig. 1. Fig. 3 is a section just inside the right-hand side of the frame, looking to the left, and showing the gripper-operating mechanism. Fig. 4 is a view of the cam turned one hundred and eighty degrees, and Figs. 5, 6, and 7 are diagrammatic views illustrating the way the folds are made in the paper.

In detail, 1 represents the folder-frame, and mounted on the top of the same is the usual slotted guide-plate 2. The usual endless tapes 3 3 are arranged so as to carry a sheet of paper sidewise of the machine over the slotted guide-plate 2, as is well understood.

Journaled in bearings 4 4, held in the frame 1, is the shaft 5. A folding-cylinder 6 has the driving-gear 7 fitted and fastened into one end of the same and the cam-gears 8 and 9 fitted into the other. The driving-gear 7 is keyed to the shaft 5, and the gear 7 is pinned to the cylinder 6. The gear 9 fits on the hub of the gear 8, and the gears 8 and 9 and the cylinder 6 are pinned together, and the gear 8 is keyed to the shaft 5. Thus the gears 7, 8, and 9, the cylinder 6, and the shaft 5 form one structure or cylinder and revolve together. The cylinder 6 has two slots or grooves, in which are mounted the shafts 10 and 11, which carry sets of gripper-fingers in the usual manner. These shafts 10 and 11 are extended through the gear 8, and have mounted on their ends the usual arms 100 and

101, respectively. These arms have springs attached to the same and to the hub of the gear 8, as shown, so that the tendency of the gripper-fingers is to remain normally closed. 55

Mounted on the hub of the gear 8, but fastened to the frame so as not to turn, is the cam 102. This cam has the three projections 103, 104, and 105, which are so proportioned that when the rear ends of the arms 100 and 101 run over the same the grippers will be opened. The cam may be turned one hundred and eighty degrees, as shown in Fig. 4, and fastened in this position, so that the grippers will operate to handle a four-page paper, as hereinafter described. A small roll 12 is geared to the cylinder 6 and runs in contact therewith, for a purpose presently described. 60

A shaft 13 is journaled above the frame, and on this shaft are fastened the arms 14 14. The arms are fastened together by means of brace 15, and in the ends of the arms is fastened the shaft 16. Running on this shaft 16 between suitable collars 17 17 is the roll 18, carrying the knife or tucker 19. The roll 18 has the end plugs 20 21, which form the bearings on the shaft 16, and the plug 21 is cut to form a pinion. The pinion 21 meshes with the gear 9, and the latter has the flattened or depressed portion 22. As described, the roll 18 is driven from the cylinder 6 by means of the gear 9 and the pinion 21, and the roll is free to move around the shaft 13 as a center. 65

Ordinarily as the roll 18 and the knife 19 revolve the knife 19 will clear the cylinder 6, as the gear 9 holds the pinion 21, and thus the roll 18, away from the cylinder 6. In other words, the pitch radius of gear 9 plus the pitch radius of pinion 21 is greater than the radius of cylinder 6 plus the distance of the point of the knife 19 to the center of the roll 18; but when the depressed portion 22 of gear 9 comes in mesh with pinion 21 the roll 18 will no longer be held away from cylinder 6, but the weight of the roll and its frame will force the knife 19 against the cylinder 6, and as this depressed portion of gear 9 is in line with the slot in which is shaft 10 the knife 19 will drop into said slot. This knife 19 will at all other times clear the cylinder 6. A second tucker mechanism is arranged as 70 75 80 85 90 95 100

shown. This tucker is similar in construction to that before described, and consists of arms 23 and brace 24. The arms 23 are fastened on the shaft 25, journaled in the frame, and said arms carry the fixed shaft 26, and running on this shaft is the roll 27, having the tucker 28. Instead of operating by gravity, the roll 27 is forced against the cylinder 6 by means of springs. The arms 23 have extending rear portions 29, and attached to the same are the springs 30. The other ends of these springs are attached to the eyebolts 31, passing through lugs on the frame and having the adjusting-nuts 32 32. Thus the tension of the springs 30 may be adjusted. The pinion of the roll 27 meshes with the gear 8, and as the depressed portion 33 of the latter is in line with the slot in which is shaft 11 the knife 28 will co-operate with the same. This particular tucker mechanism is applicable to any form of folding-machine in which a tucker or creaser is used to start the sheets in any manner into or between folding-rollers, and I wish to be understood as so intending to cover the same. The sheets are stripped from cylinder 6 by stripper-fingers 34, which direct the sheets onto tapes 35, running over cylinder 36. The operation of the machine will now be described.

If an eight-page paper is desired, a sheet four pages wide printed in the manner shown in Fig. 5 is fed sidewise onto the machine, a layer of paste being deposited at the point indicated. The sheet is then tucked by the knife 19 into the slot 10, and the grippers seize and carry the same around the cylinder 6 and between the same and the roll 12. As soon as the grippers pass the roll 12 the grippers release the edge of the sheet, so that the same falls down, as shown in Fig. 6. Now when in proper position the knife 28 will tuck the sheet into the slot in which is shaft 11, and the grippers in this slot will seize and carry the fold thus formed down between the cylinder 6 and the roll 36. Here the sheet will be stripped from cylinder 6 and delivered onto the tapes 35. From these tapes the sheet may be trimmed and further folded, as described in my application before referred to. For a six-page paper the right-hand leaf is omitted. During the operation of folding a six or eight page paper the cam 102 is set as shown in Fig. 3. Thus the grippers on shaft 10 will open to receive the sheet as the same is tucked by knife 19, and will carry this fold until the sheet is firmly in the bite of cylinders 6 and 12, and will then release the same, so that the sheet will be carried or dropped down, as shown in Fig. 6. The grippers on shaft 11 will open to receive the sheet as the same is given the second fold by knife 28, and will carry the same around and open to deliver the same onto the tapes, as before described. For a four-page paper the cam is turned and fastened, as shown in Fig. 4. Now the grippers will not open until the fold formed by knife 19 is delivered onto the tapes,

as is readily seen. During this operation the second folding mechanism is thrown out, which may be done in various ways, as by releasing springs 30 and throwing the tucker mechanism back out of gear. Thus it will be seen that an improved tucker mechanism is provided, and also a compact folding-machine that will fold, paste, and trim eight, six, or four page papers in a very rapid and accurate manner. It will be seen that the gear and pinion are in effect simply a cam and roller, and of course it would be within the scope of my invention to use simply a cam and roller between the cylinder and rolls, and, if found necessary, drive the rolls 18 and 27 by any suitable form of gearing.

The details of construction herein shown and described may be greatly varied by a skilled mechanic without departing from the scope of my invention as expressed in the claims.

Having thus fully described my invention, what I claim, and desire to secure by Letters Patent, is—

1. In a folding-machine, the combination of a cylinder having a gripping mechanism, a cam-shaped gear mounted to turn with said cylinder, and a rotary knife or tucker having a pinion co-acting with said cam-shaped gear, said rotary tucker being independent of said cylinder and gear and adapted to form a fold in a sheet and tuck the same into said gripper mechanism, substantially as described.
2. In a folding-machine, the combination of a cylinder having a gripper mechanism, a cam-shaped gear mounted to turn with said cylinder, a pivoted frame carrying a rotary knife or tucker, the latter having a pinion coacting with said cam-shaped gear, said rotary tucker being independent of said cylinder and gear and adapted to form a fold in a sheet and tuck the same into said gripper mechanism, substantially as described.
3. In a folding-machine, the combination of a cylinder having two sets of gripper mechanisms disposed at opposite points on the same, two cam-shaped gears carried by said cylinder, and two independent rotary tuckers, each having a pinion co-operating with one of said cam-shaped gears, the whole so arranged and timed that two folds will be made on said cylinder, substantially as described.
4. In a folding-machine, the combination of a cylinder having a gripper mechanism, a cam-shaped gear carried by said cylinder, a pivoted frame carrying a shaft, a roll having a tucker running on said shaft, said roll also having a pinion meshing with said cam-shaped gear, the whole so arranged that the said tucker will act to fold a sheet and tuck the said fold into said gripper mechanism, substantially as described.
5. The combination of cylinder 6, having a gripper mechanism and a cam-shaped gear 9, the roller 12, geared to cylinder 6, the roll 18, having a tucker 19, and a pinion 21, meshing

with the cam-shaped gear 9, said roll 18 being independent of cylinder 6, substantially as described.

6. The combination of cylinder 6, having
5 slots, two gripper mechanisms, and gears 8 and 9, the roller 12, geared to cylinder 6, the roll 18, having knife 19, and the pinion 21, meshing with the gear 9, the roll 27, having knife 26, and a pinion meshing with the gear 8, the
10 gears 8 and 9 having depressed portions,

whereby the rolls 18 and 27 are allowed to approach and are forced from the cylinder 6, substantially as described.

In testimony whereof I have hereunto set my hand in the presence of two subscribing
15 witnesses.

JOHN H. STONEMETZ.

Witnesses:

LOUIS W. SOUTHGATE,
R. H. SOUTHGATE.