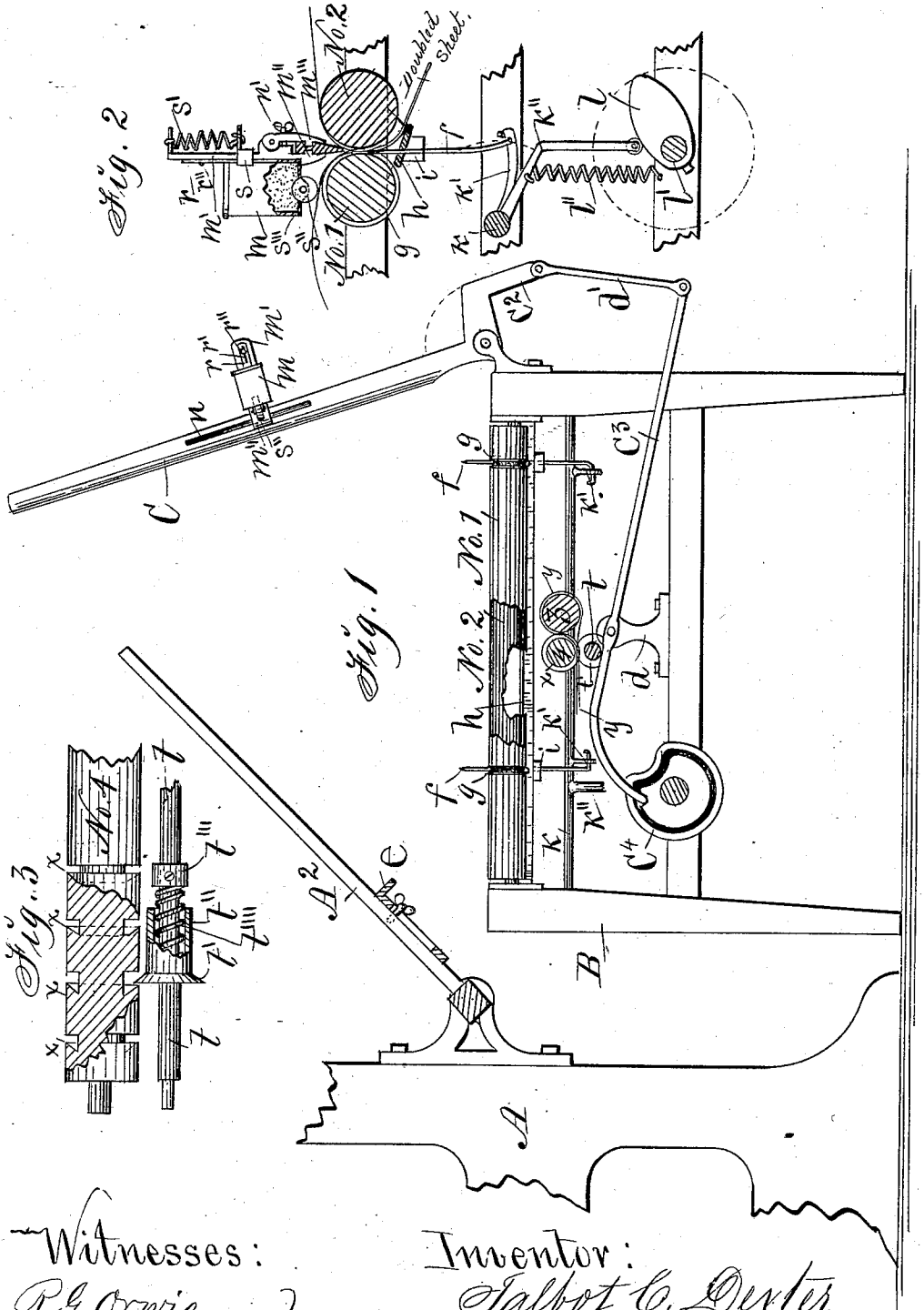
(No Model.)

T. C. DEXTER.

PAPER FOLDING MACHINE.

No. 279,083. Patented June 5, 1883.



Witnesses:
R. G. Orwig.
C. W. Nicholas.

Inventor:
Talbot C. Dexter,
By Thomas G. Orwig, atty.

N. PETERS. Photo-Lithographer, Washington, D. C.

UNITED STATES PATENT OFFICE.

TALBOT C. DEXTER, OF DES MOINES, IOWA.

PAPER-FOLDING MACHINE.

SPECIFICATION forming part of Letters Patent No. 279,083, dated June 5, 1883.

Application filed May 23, 1881. (No model.)

To all whom it may concern:

Be it known that I, TALBOT C. DEXTER, of Des Moines, in the county of Polk and State of Iowa, have invented an Improvement in Paper-Folding Machinery, of which the following is a specification.

My invention relates to the machine shown and described in the United States Letters Patent No. 247,178, issued September 20, 1881; and it consists in arranging and combining relative to each other and a printing-press a vibrating folding-blade, a spring-seated self-adjusting paste-cup, a sheet-deflecting bar, reciprocating needles, folding-rollers, and paper-cutting mechanism, as hereinafter fully set forth, in such a manner that all the operative parts will act in concert with each other and the press to automatically fold, paste, and trim sheets as rapidly as they are printed and delivered by the fly of the press.

Figure 1 of my accompanying drawings is a vertical and sectional view of a press and my folding-machine, showing the relative positions of various co-operating devices. Fig. 2 is a detail view of the paper-holding, paper-directing, and pasting devices. Fig. 3 is a detail view of my improved paper-cutting mechanism. Jointly considered, they clearly illustrate the construction and operation of my complete invention.

A represents a part of the frame of a printing-press, and A^2 the fly.

B represents the frame that supports my folding mechanism.

Nos. 1 and 2 are the rollers between which the sheet is passed to form the first fold.

C is a folding-blade, pivoted at its rear end to the frame B by means of a suitable bracket in such a manner that it will be immediately over the rollers Nos. 1 and 2, as required, to double a sheet and start it downward between the said rollers.

C^2 is an elbow-shaped crank or short arm, that extends from the pivoted end of the blade C.

C^3 is a lever pivoted to a bearing, *d*, that is fixed to the frame B.

C^4 is a cam-wheel fixed to a rotating shaft. It has a continuous groove in its side face, into which the bent end of the short arm of the lever C^3 enters, as required, to impart a vibratory motion to the lever by means of the rotating cam.

d' is a pitman, by means of which the long arm of the lever C^3 is flexibly connected with the arm C^2, that extends from the end of the folding-blade C, as required, to transmit motion from the rotating cam C^4, to vibrate the said blade at regular intervals and in concert with the motions of the fly A^2, for the purpose of doubling the printed sheets and starting them downward successively between the rollers Nos. 1 and 2 as regularly as they are delivered by said fly.

e is an adjustable gage attached to the under side of the fly A^2, to restrict the descent of a sheet as it comes down from the cylinder over the fly, and also to bring it into a perfectly square position relative to the fly and the folding-rollers Nos. 1 and 2. By moving the gage up and down on the fly the delivery of different-sized sheets can also be readily governed, so as to bring the center of each folio immediately over the center of the second pair of folding-rollers Nos. 3 and 4, as required to form quartos.

f f are needles designed to project upward through the annular grooves *g g*, formed in the folding-roller No. 1, in such a manner that they will pass through the central line of each sheet as it is thrown down by the fly A^2, for the purpose of retaining the sheet in a square and central position relative to the rollers Nos. 1 and 2, until the folding-blade C descends upon the sheet and doubles it downward between said rollers.

h is a sheet-directing bar, fixed at its ends to the frame B in such a manner that it will extend longitudinally and in an inclined position along the under side of the roller No. 1 and away from it, as required, to direct a descending sheet laterally to pass over and move longitudinally relative to the rollers Nos. 3 and 4, that are designed to make a second fold at right angles to the first fold.

i i are perforated enlargements or blocks formed on or fixed to the under side of the bar *h*, to form bearings for the needles *f*.

k is a rock-shaft mounted in bearings attached to the frame B, in such a position relative to the bar *h* that the ends of the arms *k'* extending from the rock-shaft will be immedi-

ately under the needle-bearings *i*. By attaching the lower ends of the needles *f* to the free ends of the arms *k'*, a reciprocating vertical motion can be imparted to the needles by means of the rock-shaft.

k'' (shown in Fig. 2) is an elbow-shaped arm, extending downward from the shaft *k* to engage a cam, *l*, that is fixed to a rotating shaft, *l'*, that has its bearings formed in or attached to the frame B. An anti-friction roller on the end of the arm *k''* facilitates the operation of the arm and shaft, as required, to elevate the needles *f* at every revolution of the cam.

l'' is a spring fixed to the arm *k''* and the frame B, to aid in pulling down the arms *k''* *k'* of the rock-shaft at regular intervals, as required, to withdraw the tops of the needles *f* downward and into the bearings *i*, to allow a moving sheet to pass down between the rollers Nos. 1 and 2, and then laterally over the sheet-directing bar *h*.

m is a sheet-metal paste-cup, adjustably and detachably connected with the vibrating folding-blade C by means of a bar, *m'*, that has toothed jaws *m''* and *m'''*, that slide on the blade. The teeth on the jaws enter corresponding grooves, *n*, formed in the side faces of the blade, and are clamped fast by means of a set-screw, *n'*, that passes through the hinged jaw *m'''* and into the rigid jaw *m''*.

r is a bar extending upward from the back of the cup *m*. It has a slot, *r'*, through which a stud, *r''*, projects from the face of the bar *m'*, to guide the movements of the cup *m* relative to the bar *m'* and the folding-blade C.

s is a loop or bearing that projects from the cup *m* to engage the bar *m'*.

s' is a spring that in its normal condition presses the cup *m* downward toward the blade C.

s'' is a revolving disk or brush, fitted in a corresponding cavity, *s'''*, formed in the bottom of the paste-cup, and supported by bearings extending from the bottom of the cup. When the folding-blade descends and doubles a sheet into a folio, the revolving brush *s''* comes in contact with the sheet and remains there until the sheet has passed over the roller No. 1, and as required to deposit paste along the center of one of the pages of the folio previous to folding it into a quarto.

t is an auxiliary shaft mounted immediately below and parallel to the folding-roller No. 4, as shown in Fig. 1. It is connected with roller No. 4 by means of a gear-wheel, and revolves toward the roller.

t' is a circular cutter formed on or fixed to the end of a sleeve, *t''*, that slides on the shaft *t*. The outside face of the cutter is straight and the inside beveled.

t''' is an adjustable collar on the shaft *t*.

t'''' is a coiled spring inclosed in the sleeve *t''*, and engages the collar *t'''* in such a manner that it will, in its normal condition, press the cutter away from the collar and against one of the series of circular cutting-edges *x*, of peculiar construction, formed on the end portion of the folding-roller No. 4, as shown in Fig. 3, by making a series of grooves in the periphery or steel face of the roller (by means of a turning-lathe or in any suitable way) that are straight on one side and beveled on the other, to produce cutting-edges *x*, that are of triangular shape in their cross-sections, and present one of their sides to support the sheets of paper, while the revolving cutter *t'* extends into the groove, and is held closely to the cutting-edge *x* by means of the spring *t''''*, as required, to trim off the doubled edge of the sheet in quarto that extends over the cutting-edge *x*, and is advanced by the concerted action of the folding-rollers, the cutters, and the carrying-tapes *y*, that surround the roller No. 3 and pass horizontally between the roller No. 4 and the shaft *t*, to deliver the pasted and cut quartos to another pair of folding-rollers or to a suitable receptacle.

From the detailed description of the construction and function of each part of my invention their unitary action and practical operation are obvious.

I claim as my invention—

1. A detachable and adjustable bar or frame carrying a spring-seated paste-cup, in combination with a folding-blade, for the purposes specified.

2. The pasting device for folding-machines, composed of the bar *m'*, having jaws *m''* and *m'''*, a paste-cup, *m*, having a handle or extension, *r r''*, a loop, *s*, a roller or brush, *s''*, and a spring, *s'*, substantially as shown and described.

3. The bar *m'*, having jaws *m''* and *m'''*, and carrying a spring-seated paste-cup adjustable upon and in combination with a vibrating folding-blade, substantially as shown and described, for the purposes specified.

4. The fly of a printing-press, carrying an adjustable sheet-supporting device, *e*, the folding-rollers Nos. 1 and 2, the folding-blade C C^2, carrying a self-adjusting pasting device, the sheet-deflecting bar *h*, having needle-bearings *i*, the reciprocating needles *f*, the folding-roller No. 3, the mating roller No. 4, having cutters *x* formed in its periphery, and the rotating shaft *t*, carrying an adjustable cutter, all arranged and combined to act in concert with a printing-press, substantially as shown and described, to automatically fold, paste, and trim printed sheets successively as they are advanced from the press to a packing-box or other suitable receptacle located under the folding mechanism.

TALBOT C. DEXTER.

Witnesses:
FRED HAMPTON,
A. R. FULTON.