

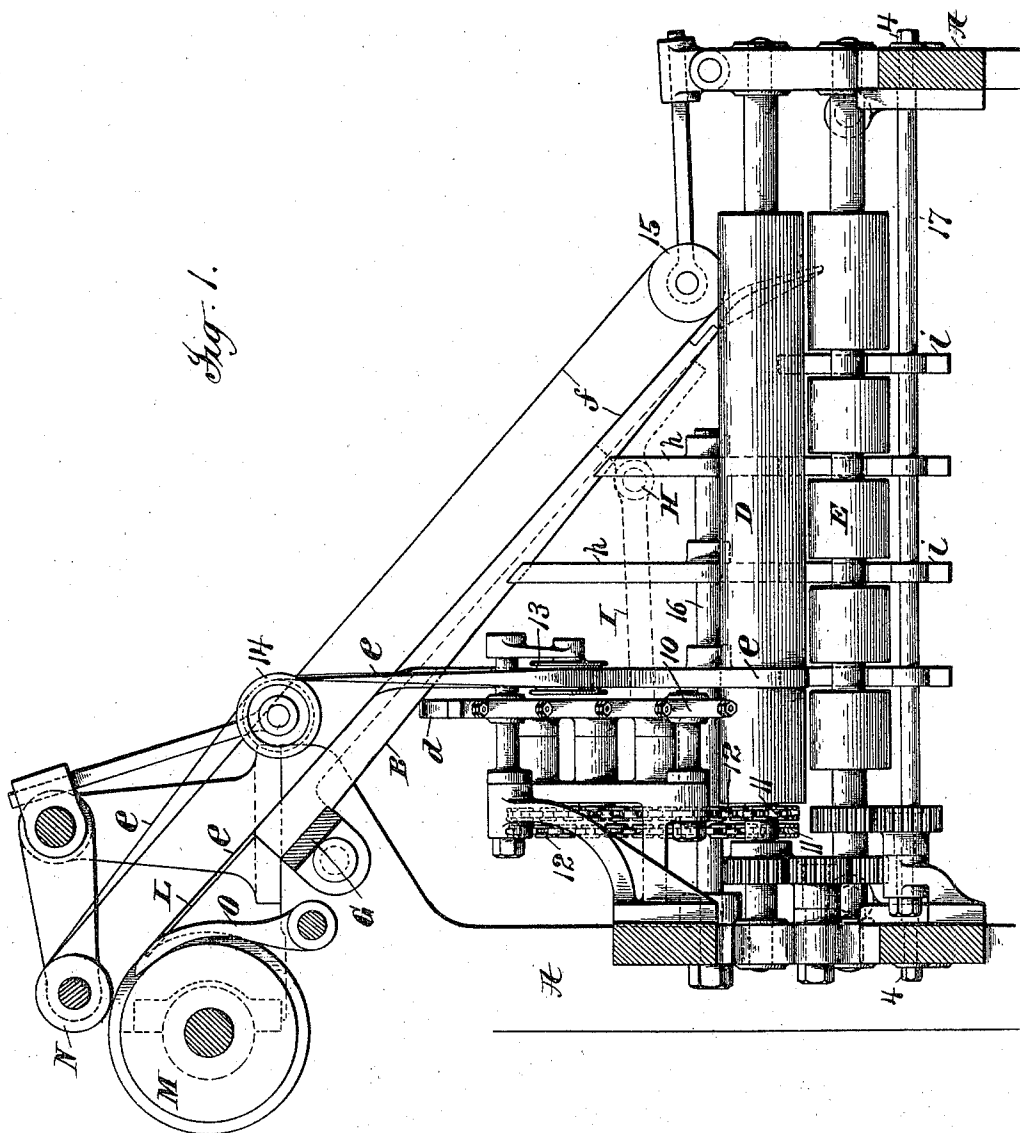
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3 Sheets—Sheet 1.

E. P. SHELDON.
PAPER FEEDING AND FOLDING MECHANISM.

No. 582,026.

Patented May 4, 1897.



Attest:

S. V. Bourke
J. M. Borst

Inventor:

Edward P. Sheldon

By Philipp Munson Phelps

Attys

(No Model.)

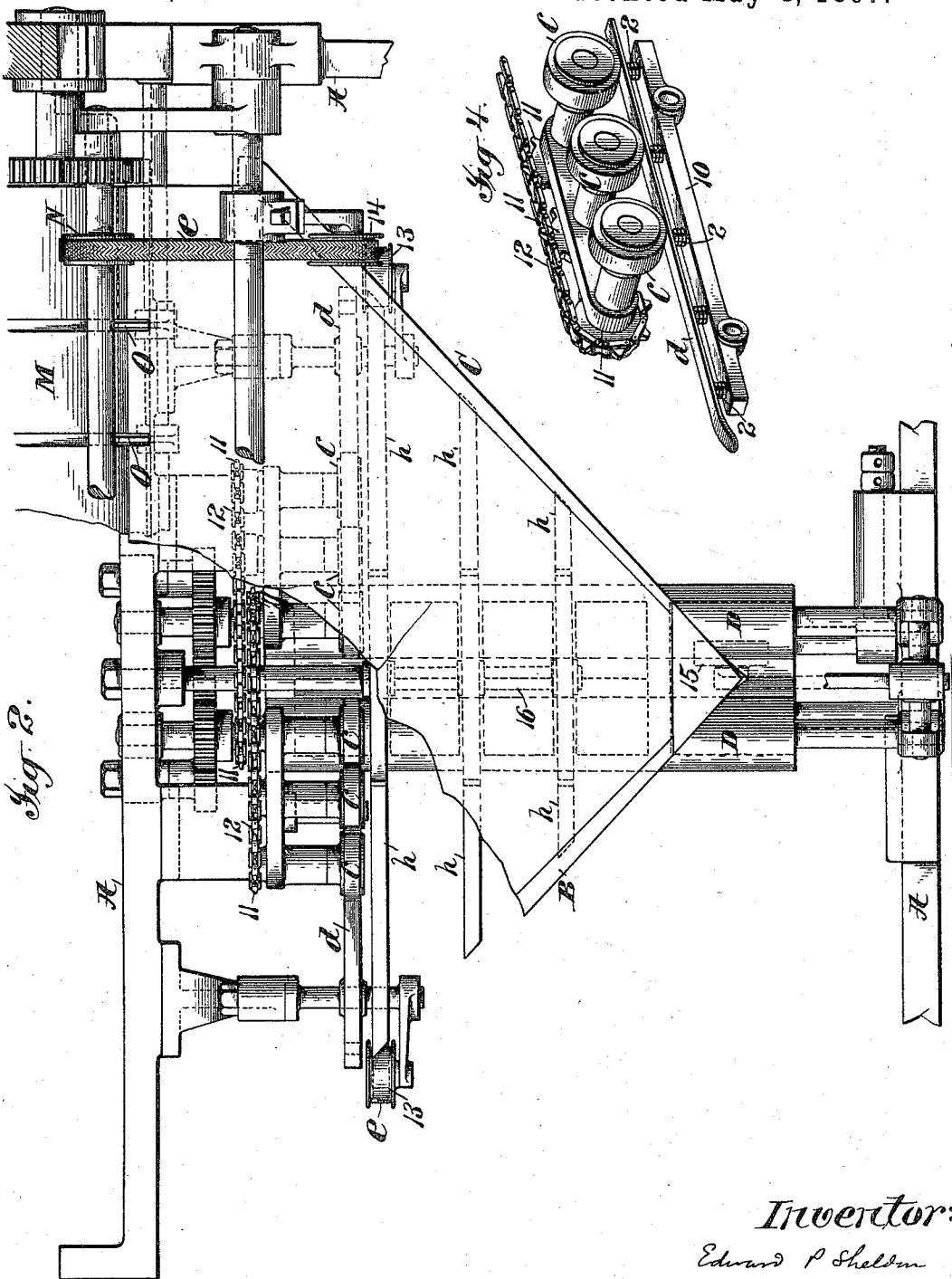
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PAPER FEEDING AND FOLDING MECHANISM.

No. 582,026.

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Attest:
J. V. T. Bourke
Jm Bourke

Inventor:
Edward P Sheldon
By Philipp Munnich Phelps

Edward P Sheldon

By Philipps Museum & helps

Atlys

(No Model.)

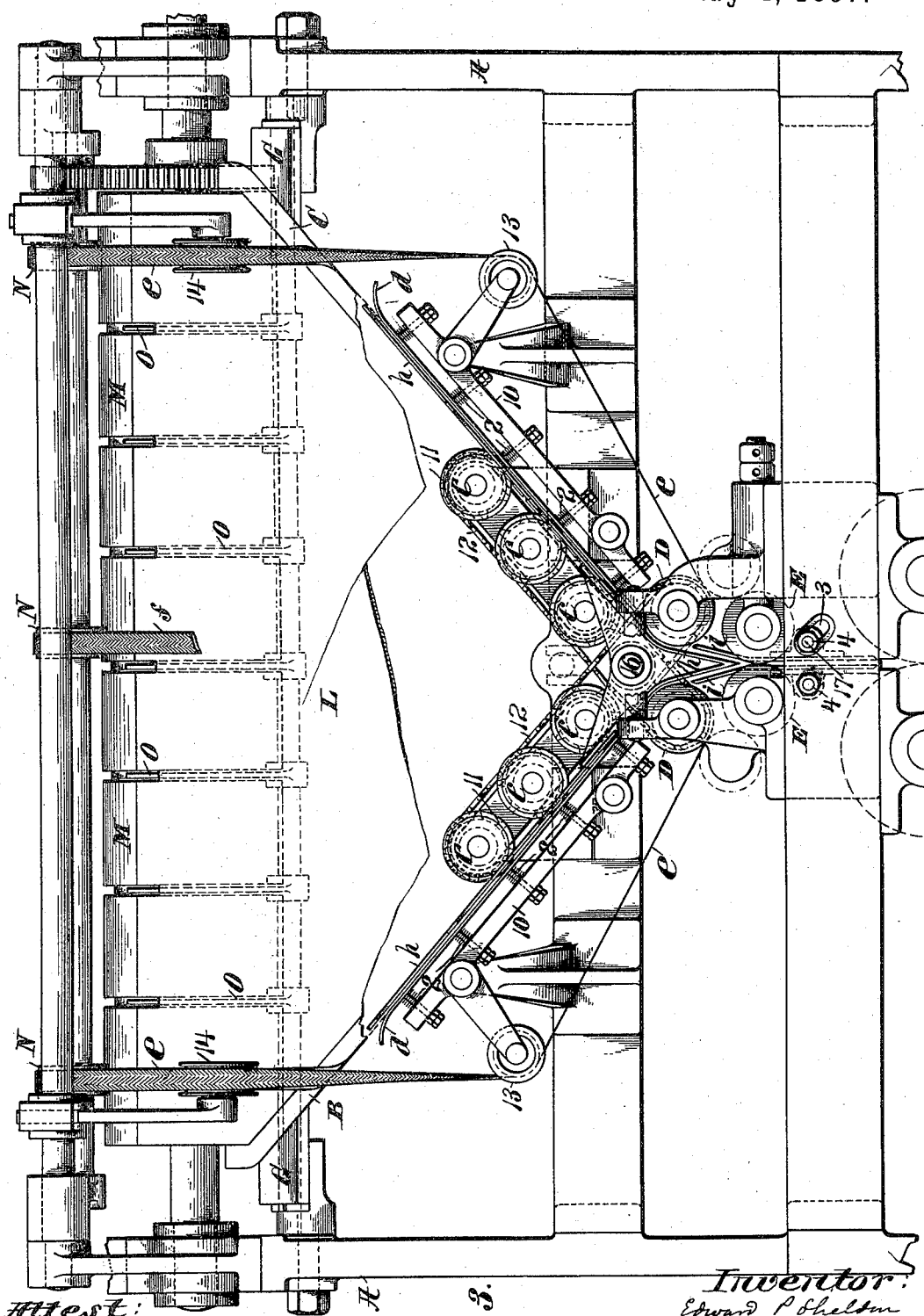
3 Sheets—Sheet 3.

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PAPER FEEDING AND FOLDING MECHANISM.

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Attest:
A. V. Bourke
J. M. Borst

Fig. 3.

Inventor:
Edward P. Sheldon
By Philipp M. M. Phelps
Attys

UNITED STATES PATENT OFFICE.

EDWARD P. SHELDON, OF BROOKLYN, NEW YORK, ASSIGNOR TO ROBERT HOE, THEODORE H. MEAD, AND CHARLES W. CARPENTER, OF NEW YORK, N. Y.

PAPER FEEDING AND FOLDING MECHANISM.

SPECIFICATION forming part of Letters Patent No. 582,026, dated May 4, 1897.

Application filed November 18, 1895. Serial No. 569,299. (No model.)

To all whom it may concern:

Be it known that I, EDWARD P. SHELDON, a citizen of the United States, residing at Brooklyn, county of Kings, and State of New York, have invented certain new and useful Improvements in Paper Feeding and Folding Mechanisms, fully described and represented in the following specification and the accompanying drawings, forming a part of the same.

The object of the present invention is to provide improved feeding devices for advancing sheets or webs of paper or similar material, and especially to secure a constant and uniform feed under proper pressure by rollers or similar feeding devices which operate by pressure upon the paper.

While the feeding devices embodying the broad invention are applicable to many other uses, the invention has been designed especially for use in that class of folding mechanism generally known as "longitudinal" folders; and the invention consists in part of features of construction in such folders.

The class of folding mechanisms referred to are those which operate to impart a longitudinal fold to material passing over or through them on the run, and more particularly such as are provided with a pair of converging internal folding guides or formers, in passing over which the material has its sides carried toward each other, so as to be doubled or folded longitudinally. Such a construction employing feeding-rollers on the opposite sides of the folder converging from the internal guides is shown in United States Letters Patent No. 492,760, and one especial object of the present invention is to provide an improved construction of folder employing such rollers or other similar feeding devices for advancing the sheets. In the use of such roller-folders it is found in practice that the rollers, being preferably rubber-faced to secure the required feeding-grip, are liable to wear unequally, and, moreover, inaccuracies in the original form of the rollers and differences in thickness of paper sometimes occur which, although slight, interfere materially with that positive and uniform pressure of the rollers upon the paper, which is important for the

feeding of sheets with certainty at the very high rates of speed required of such folders. I avoid this difficulty by the use of an elastic abutment coacting with the rollers and arranged to compensate for any irregularities in the surface of the rollers or paper, this abutment preferably being formed of a thin spring-pressed plate, against which the rollers act, this construction being found to secure the proper constant uniform pressure, notwithstanding irregularities in the surface of the feeding-rollers due to inaccuracies in original form, wear, softening, &c., and variations in thickness of the paper.

For a full understanding of the invention a detailed description of a construction embodying the same in its preferred form will now be given in connection with the accompanying drawings, forming a part of this specification, in which—

Figure 1 is a sectional side elevation of the folder. Fig. 2 is a plan view with the top plate broken away at the upper end. Fig. 3 is a front elevation with the top plate broken away at the point. Fig. 4 shows the rollers and abutment in detail.

Referring to said drawings, it will be understood that the frame A may be of any suitable construction such as is common in web-printing and other machines employing longitudinal folders of this class. B C are the internal guides over which the sides of the sheet are bent to form the fold, these internal guides being shown as consisting of bars converging between the external guides or rolls D and to the pair of rolls E, forming the folding device and from which the folded sheet may be delivered directly or pass to a delivery mechanism of any suitable form.

The internal guides B C are supported at their upper ends by a bar G, extending across the top of the folder and at their lower ends by a cross-bar H, pivotally mounted, so as to be vertically adjustable on a bar I, extending rearward under the folder and mounted in a bracket on the frame A in any suitable manner, preferably so as to be adjustable longitudinally, as usual in such constructions, the proper position of the guides B C

being thus secured. The folder may be left open at the top, only the internal guides B C being used; but a top plate L, extending between the internal guides, will preferably be used to aid in supporting the middle of the sheet and to coact with the tapes hereinafter described in feeding the sheet, and this top plate L is shown as extended beyond and rearward of the upper ends of the guides B C to a feeding-roll M, coacting with a series of pulleys N and tapes in advancing the sheets to the folder. This roll M is preferably formed of a series of disks, or grooved, as shown, so as to receive a series of fingers O, which act as guides to direct the sheets from the roll M onto the plate L, these fingers entering slots in the plate L and the grooves in the roll M. The construction thus far described is common in this class of folders, and may be varied widely.

Referring now to the features embodying the invention, there are on each side of the folder sets of marginal rollers *c*, converging on opposite sides of the folder to the rolls D, these rollers coacting with elastic abutments which in the preferred form shown consist of spring-mounted plates *d*, which are shown as carried by pins 1, adjustably mounted in support 10 and spring-pressed toward the rollers *c* by springs 2, coiled on the pins. The plates are preferably made of thin flexible metal, so as to bend readily, thus preserving contact with all the rollers in case of wear on one or more, but a rigid spring-mounted plate or a series of plates may be used. These rollers may be driven by any suitable means, but are preferably driven by endless belts or chains, sprocket-wheels 11 and chains 12 being shown, these chains 12 running from a sprocket-wheel on the upper roller *c* on each side over sprocket-wheels on the other rollers *c* to and about sprocket-wheels on the rolls D, which are driven from the rolls E by suitable gearing.

The rollers *c* are preferably rubber-faced or provided with surfaces roughened in any suitable manner to give a better grip upon the paper, as above stated, and are preferably mounted, as shown, to engage the under or inner side of the sheet with the plate *d* outside the sheet, although it will be understood that the position of these parts may be reversed. With these rollers are preferably used one or more sets of tapes *e* at each side of the folder converging from the internal guides B C, one set being shown, and these tapes are preferably continuous from the pulley N, running over the edges of the plates L and the guides B C downward on the sides of the folder, so as to feed the sheet over the top of the folder and to the rollers. These tapes not only aid in feeding the sheet, but act to secure the passage of the sheet through the folder in case the rollers *c*, which are preferably placed so as to engage only the margin of the sheet, should not advance the sheet

properly. These tapes *e* pass around rolls D and return around pulleys 13 and tightening-pulleys 14 to the pulleys N and coact with plates G, which act as abutments, against which the required pressure of the tapes *e* is secured. A central set of tapes *f* are preferably added at the top of the folder, these tapes running from pulley N above the plate L to the point of the folder, thence over pulley 15, and back to the pulley N. It will be understood that other arrangements of tapes may be used.

It is not essential that guides should be used upon the side of the folder converging from the side guides B C to the rolls D, but such guides are preferably employed, and I have shown narrow guides *h h'*, carried by a shaft or bar 16, extending under the folder from the frame A. These guides *h h'* are placed on both the inner and outer sides of the paper close together, so as to guide the leading edge of the sheet positively and prevent its catching on the edges of the rolls or other parts of the construction. The inner guides *h* extend downward between the rolls D, converging to a point just above the rolls E and between guides *i*, which extend on opposite sides of the sheets and between the rolls E and downward in the path of delivery of the sheet, being arranged in grooves in the rolls E, so that the sheet is positively guided downward to the delivery mechanism, these guides *i* being shown as carried by shafts or bars 17, mounted in the frame A. The guides *i* on one side of the sheet are shown as adjustably mounted, so as to secure the proper distance between the guides, the shafts 17 being adjustable in slots 3 in the frame A and held in position by set-nuts 4, as usual in such constructions.

While I have shown sets of three feeding-rollers on each side of the folder, and this number forms a convenient and efficient construction for longitudinal folders of the size common in newspaper-printing machines, it will be understood that the rollers may be of any suitable size or number, and this will vary with the size of the folder. While the construction has been described as applied to folding sheets, it will be understood that it is applicable also to associating two or more sheets or webs led over the opposite sides of the folder, my improved construction being admirably adapted for this use. It will be understood also that a slitter and other devices in use with present longitudinal folders are equally applicable to folders embodying the invention.

The elastic abutment may be used with pressure-feeding devices of other form than the rollers shown and is claimed broadly, and feeding devices employing such an abutment are of general application in mechanisms for feeding paper and similar material, and the broad features of the invention are not to be limited to folding mechanisms.

By the term "stationary" applied in the

claims to the abutment I mean that the abutment does not travel with the paper, but it will be understood that the abutment may have movement toward and from the feeding devices.

What is claimed is—

1. The combination with a series of feeding-rollers arranged longitudinally of the line of feed, of an elastic flexible abutment coacting with said rollers, substantially as described.
2. The combination with a series of feeding-rollers arranged longitudinally of the line of feed, of a stationary elastic flexible abutment coacting with said rollers, substantially as described.
3. The combination with a series of feeding-rollers arranged longitudinally of the line of feed, of a stationary elastic abutment coacting with said rollers, substantially as described.
4. The combination with a series of feeding-rollers arranged longitudinally of the line of feed, of a stationary elastic abutment coacting with said rollers and consisting of a plate extending in the line of feed of said rollers, substantially as described.
5. The combination with a series of feeding-rollers arranged longitudinally of the line of feed, of a stationary elastic abutment coacting with said rollers and consisting of a spring-mounted plate extending in the line of feed of said rollers, substantially as described.
6. The combination with a series of feeding-rollers arranged longitudinally of the line of feed, of a stationary elastic abutment consisting of a flexible spring-mounted plate extending in the line of feed of said rollers, substantially as described.
7. In a longitudinal folder, the combination with converging internal guides, of feeding devices on opposite sides of the folder converging from the internal guides and acting by pressure on the paper, and stationary converging elastic abutments coacting with said feeding devices, substantially as described.
8. In a longitudinal folder, the combination with converging internal guides, of feeding-rollers on opposite sides of the folder converging from the internal guides, and station-

ary converging elastic abutments coacting with said rollers, substantially as described.

9. In a longitudinal folder, the combination with converging internal guides, of feeding-rollers on opposite sides of the folder converging from the internal guides, and stationary converging elastic abutments adjustable toward and from the rollers, substantially as described.

10. In a longitudinal folder, the combination with converging internal guides, of feeding-rollers on opposite sides of the folder converging from the internal guides, stationary converging elastic abutments coacting with said rollers, and converging side guides for the paper, substantially as described.

11. In a longitudinal folder, the combination with converging internal guides, of feeding-rollers on opposite sides of the folder converging from the internal guides, stationary converging elastic abutments coacting with said rollers, feeding-tapes converging from the internal guides, and converging side guides for the paper, substantially as described.

12. In a longitudinal folder, the combination with converging internal guides, of feeding-rollers on opposite sides of the folder converging from the internal guides, and stationary converging elastic abutments consisting of spring-mounted plates extending in the line of feed of said rollers, substantially as described.

13. In a longitudinal folder, the combination with converging internal guides, of feeding-rollers on opposite sides of the folder converging from the internal guides, and stationary converging elastic abutments consisting of flexible spring-mounted metal plates extending in the line of feed of said rollers, substantially as described.

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

EDWARD P. SHELDON.

Witnesses:

F. W. H. CRANE,
E. L. SPEIR.