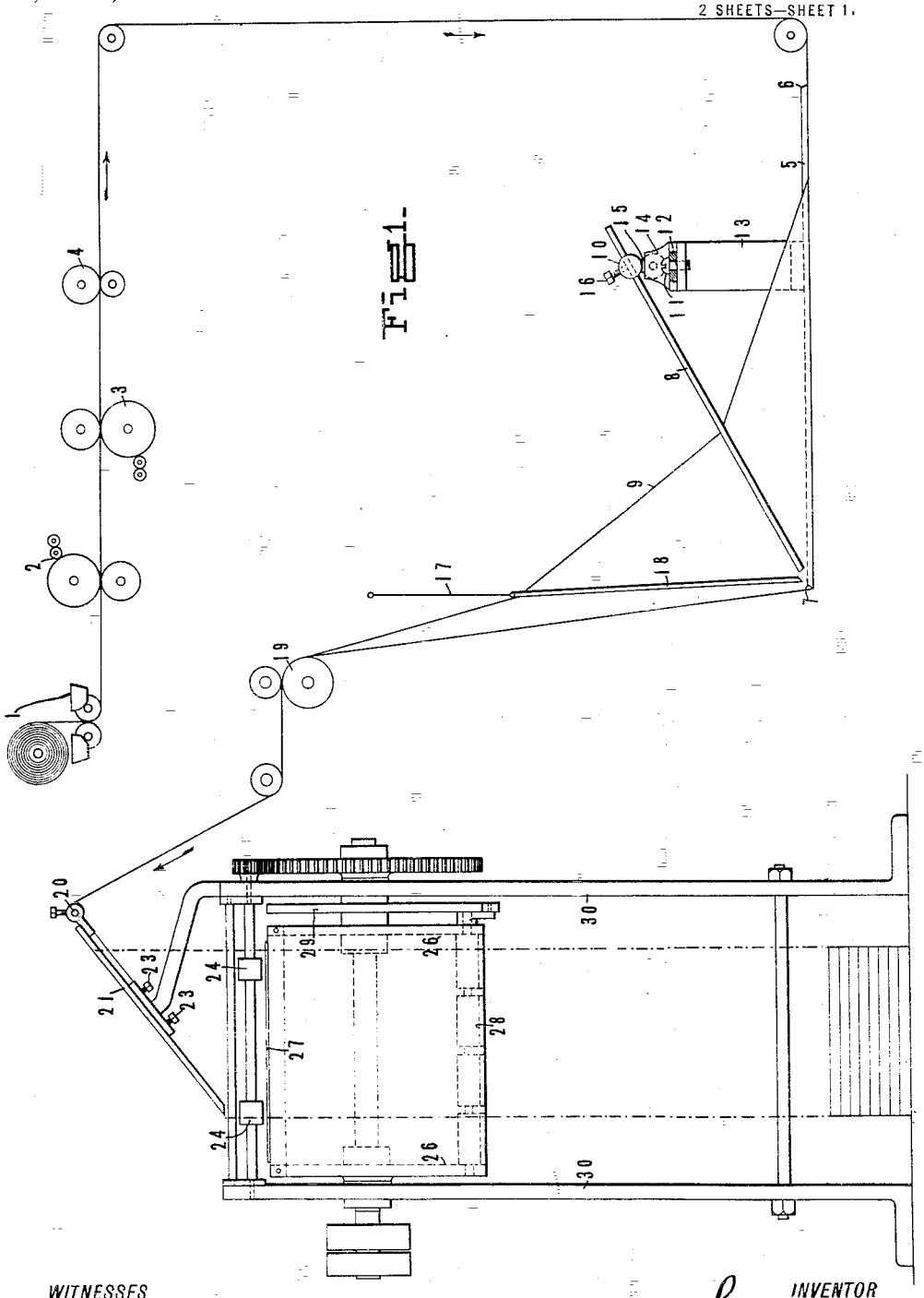
L. F. HAGEMAN, Jr.

APPARATUS FOR TREATING WEBS.

APPLICATION FILED MAR. 16, 1912.

1,183,005. Patented May 16, 1916.

2 SHEETS—SHEET 1.



WITNESSES

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2 SHEETS—SHEET 2.

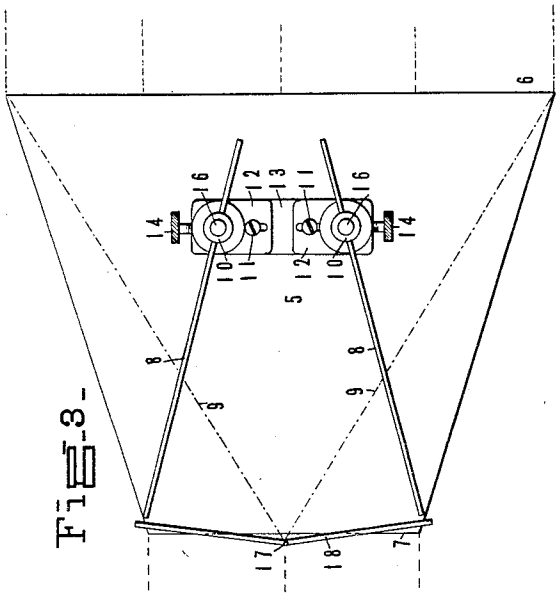


FIG. 3.

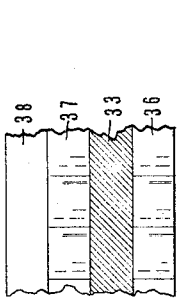


FIG. 5.

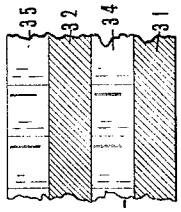


FIG. 4.

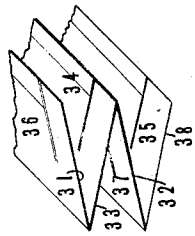


FIG. 6.

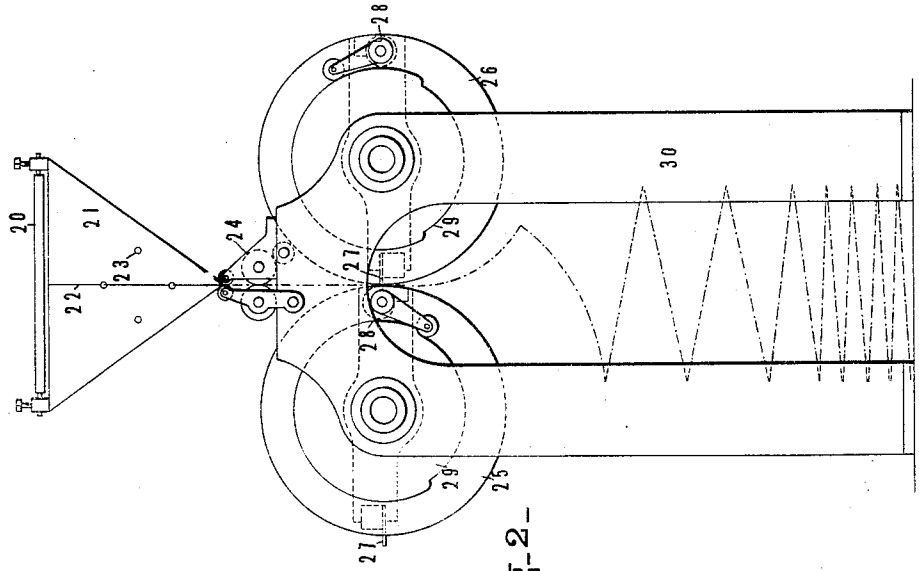


FIG. 2.

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UNITED STATES PATENT OFFICE.

LOUIS F. HAGEMAN, JR., OF NIAGARA FALLS, NEW YORK, ASSIGNOR TO AMERICAN SALES BOOK COMPANY, LIMITED, OF TORONTO, ONTARIO, CANADA, A CORPORATION OF CANADA.

APPARATUS FOR TREATING WEBS.

1,183,005. Specification of Letters Patent. Patented May 16, 1916.

Application filed March 16, 1912. Serial No. 684,169.

To all whom it may concern:

Be it known that I, LOUIS F. HAGEMAN, Jr., a citizen of the United States, residing at Niagara Falls, in the county of Niagara and State of New York, have invented certain new and useful Improvements in Apparatus for Treating Webs, of which the following is a full, clear, and exact description, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to an apparatus for treating webs of paper and with regard to certain more specific features thereof, to the treatment of continuous webs adapted for use in recording machines, sales books, and the like.

One of the objects of this invention is to provide a practical and efficient mechanism or apparatus for treating and folding a web whereby it may be subsequently used in recording machines, sales books, or the like for producing a plurality of records of any transaction with a minimum amount of manipulation on the part of the operator.

A further object of this invention is to provide an inexpensive and self-contained mechanism for treating and folding webs of a paper particularly adapted for use with the above mentioned devices, by the use of which the carbon sheets heretofore required in producing manifold copies of a transaction are eliminated.

Other object will be in part obvious and in part pointed out hereinafter.

The invention accordingly consists in the several steps and the relation and order of one or more of such steps with relation to each of the others thereof, and in the features of construction, combinations of elements and arrangement of parts, which will be exemplified in the construction hereinafter set forth, and the scope of the application of each of which will be indicated in the following claims.

In the accompanying drawings wherein is shown one of various possible embodiments of this invention, Figure 1 is a partial diagrammatic view showing the complete apparatus; Fig. 2 is an elevational view of the final folding mechanisms shown at the left of Fig. 1, taken at right angles to that figure; Fig. 3 is a plan view of the first folding mechanism shown at the right of Fig. 1; Figs. 4 and 5 are detailed views respectively of opposite sides of the web before the same is folded; Fig. 6 is a perspective view of a transverse section of the folded web.

Similar reference characters refer to similar parts throughout the several views of the drawing.

Referring now to the drawings in detail and more particularly Fig. 1, there is denoted diagrammatically at 1 the mechanism or means for coating a web of paper longitudinally in parallel sections along its opposite sides as shown by the heavy sectioning in Figs. 4 and 5. As this may be done in any desired manner it is thought unnecessary to go into the details of the construction of this apparatus, the method and materials used in coating paper with a manifolding substance and permitting the same to dry being old and well known in the art. The web is then passed through printing mechanisms 2 and 3 which print upon the opposite sides of the web along the uncoated sections. The printed matter usually consisting of the name and address of the company ordering the "fillers" for its use, together with such other data, ruled lines, etc., as may be necessary, according to the use to which they are put. The web then passes through a perforating mechanism 4 which perforates the web longitudinally along the lines separating the coated and printed sections. As herein shown the web is divided into four sections, although the same apparatus is adapted to handle webs of three sections as will appear obvious from the description hereinafter set forth or by slight modifications it may be changed to handle a greater number as desired.

After being coated, printed and perforated the web is conducted to a folding mechanism adapted to fold the two outer sections over upon the two inner sections. While this folding mechanism is shown diagrammatically detached from the printing mechanism, it is in practice directly connected therewith and may be considered as an attachment therefor. This folding mechanism comprises a base plate 5 under which the web is adapted to pass, the rear edge 6 of the plate being substantially the width of the entire four sections of the web. The forward edge 7 is but one-half the width or equal to the combined width of the two in-

ner sections. The outer edges of the web, assuming the machine to have been previously started and now in operation, are bent inwardly under diverging guide arms 8, the edges of the paper being represented by the dotted lines 9. These guide arms are mounted in swiveled blocks 10, which are universally adjustable, that is, they may be adjusted transversely of the web by means of the screws 11 engaging the base blocks 12 mounted upon the standard 13; they may be adjusted vertically by loosening the set screws 14 and moving the pin 15 supporting blocks 10 up or down, or they may be swung about a vertical axis by this same mechanism. Set screws 16 permit the arms 8 to be adjusted in the direction of their length through the block 10.

Freely suspended above the forward edge 7 of plate 5 by means of a flexible suspension member 17 are a pair of diverging arms 18, the arms constituting an inverted V-shaped member. The edges of the web 9 pass under these arms and are pressed more nearly into the plane of the inner sections of the web as the same is conducted upwardly through creasing rollers 19. By freely suspending the member 18 in this manner the tendency to tear the web if subjected to an abnormal tension is lessened.

After passing through the creasing rollers 19 the web is conducted over the adjustably mounted roller 20 and thence over a V-shaped folding plate 21 whereby the web is folded along its central line of perforations back upon itself. This folding plate 21 is divided into two parts along the line 22 whereby they may be adjusted up and down relatively to each other by means of set screws 23. Thus if the web should be feeding improperly, that is with the line of perforations to one side of the apex of the folder 21, one side or the other is raised as may be necessary so that the web is straightened and folded exactly upon its line of perforations as it passes through the creasing rollers 24. At this stage the folding of the web longitudinally in zigzag form as shown in Fig. 6 is completed. It is then passed through continuous fold mechanism for folding the same transversely of its length into the zigzag form shown in Fig. 2. This mechanism which is of well known style comprises substantially tangential feed rollers 25 and 26 each having a folder blade 27 and grippers 28 diametrically opposite each other controlled by means of cams 29, the operation being the engagement of the web by the folder blade 27 between the jaws of the gripper 28 which latter carries the web down and around through a portion of its path of travel, whereupon the jaws release the web and it is permitted to drop into a receiving box 30. The next blade then engages the web and the coacting gripper jaws carry it into the opposite direction down and around to produce a fold in the opposite direction. The distance between the folds is equal to the length of a printed sheet. The web may then be cut by hand after the desired number of folds have been delivered into the receiving box 30.

Figs. 4 and 5 denoting the opposite sides of the web, are coated as indicated by the heavy lines 31 and 32 upon one side and the single section 33 upon the opposite side, and are printed upon the sections 34 and 35 upon the first mentioned side and 36 and 37 upon the other, the section 38 which is the back of the under sheet being plain. As the web is folded the sections 31 and 35 are folded over sections 34 and 32 respectively and the web is subsequently folded along the center line between the sections 32 and 34 in the opposite direction so that it assumes the form shown in Fig. 6 with a coated surface between each pair of printed surfaces, whereby a plurality of records may be made through the manifolding material without the use of separate carbon sheets, that is, the web may be fed directly into a typewriter or recording machine and records produced with the minimum amount of manipulation on the part of the operator.

While the above invention has been described with relation to its operation upon a web divided into four sections, it may be operated in a similar manner upon a web divided into three sections. In this case the web is passed through the same mechanism without altering it in any way, the only difference being in passing the web through the mechanism shown in Fig. 3, one edge coincides with one end of the edge 6 while the opposite edge coincides with the opposite end of the edge 7. In this manner only one outer section is folded over on to the middle section of the three sections of the web. The subsequent treatment of the web is substantially the same.

It is thus seen that this invention constitutes a practical and simple device for accomplishing, among others, all the objects and advantages above set forth.

As many changes could be made in the above construction, and many apparently widely different embodiments of this invention could be made without departing from the scope thereof, it is intended that all matter contained in the above description or shown in the accompanying drawings shall be interpreted as illustrative and not in a limiting sense.

Having described my invention, what I claim as new and desire to secure by Letters Patent is:

1. In an apparatus for treating webs, in combination, means for feeding a web, means for folding the web in longitudinal

folds in zigzag relation to each other, and means for folding the folded web upon itself on transverse lines.

2. In an apparatus of the character described, in combination, means for feeding a web, means for folding the web in zigzag form with the folds extending longitudinally thereof and each fold longitudinally continuous, and means for folding the web upon itself transversely.

3. In apparatus of the character described, means for perforating a web longitudinally, means for folding the web longitudinally along the perforations in zigzag form, and means for folding the web upon itself transversely, as described.

4. In an apparatus of the character described, in combination, means for coating a web in longitudinal sections, means for printing upon the web on its uncoated sections, and separate means for folding the strip back and forth upon itself both longitudinally and transversely.

5. In an apparatus of the character described, in combination, means for folding a web longitudinally back and forth upon itself, comprising a plate under which the web is adapted to pass, means for directing the outer edges of the web over the central portions thereof, freely suspended means for directing the outer edges of the web down upon the central portion, and rollers through which the web is adapted to pass to crease the same longitudinally.

6. In an apparatus of the character described, in combination, a folding device comprising a holding means for the central part of the web, and freely suspended means for engaging the outer edges of the web for folding them in to substantially the plane of the central part of the web.

7. In an apparatus of the character described, in combination, a folding device comprising a wedge shaped plate under which the web is adapted to pass, and freely suspended means for engaging the outer edges of the web for folding them into substantially the plane of the central portion of the web, said means comprising an inverted V-shaped member suspended at its apex.

8. In an apparatus of the character described, in combination, a folding mechanism, comprising divergent arms adapted to engage and direct the outer edges of the web over the central portion of the web, means for adjusting said arms, and an auxiliary means for moving the folded-over edges of the web into substantially the plane of the central portion of the web, said means including a pair of freely suspended divergent arms.

9. In an apparatus of the character described, in combination, a folding mechanism, comprising a wedge-shaped plate under which the web is adapted to pass, means mounted above said plate adapted to engage and direct the outer edges of the web inwardly and over the central portion of the web, means for adjusting said first mentioned means in any direction, auxiliary means including freely suspended diverging arms for subsequently engaging the outer edges of the web and moving the same more nearly into the plane of the central portion of the web, and means for creasing the web along its folded lines.

10. In an apparatus of the character described, in combination, a folding mechanism, comprising a wedge-shaped plate under which the web is adapted to pass, means mounted above said plate adapted to engage and direct the outer edges of the web inwardly and over the central portion of the web, means for adjusting said first mentioned means in any direction, auxiliary means including freely suspended diverging arms for subsequently engaging the outer edges of the web and moving the same more nearly into the plane of the central portion of the web, means for creasing the web along its folded lines, and means for subsequently folding the web along its center.

11. In an apparatus of the character described, in combination, a folding mechanism comprising a plate under which the web is adapted to pass, diverging arms mounted above said plate adapted to engage and direct the outer edges of the web inwardly and over the central portion of the web, means for adjusting said arms in any direction, freely suspended diverging arms for subsequently engaging the outer edges of the web and moving the same more nearly into the plane of the central portion of the web, means for creasing the web along its folded lines, and means for subsequently folding the web in an opposite direction along a center line.

12. In an apparatus of the character described, in combination, a folding mechanism comprising a plate under which the web is adapted to pass, diverging arms mounted above said plate adapted to engage and direct the outer edges of the web inwardly and over the central portion of the web, means for adjusting said arms in any direction, freely suspended diverging arms for subsequently engaging the outer edges of the web and moving the same more nearly into the plane of the central portion of the web, means for creasing the web along its folded lines, means for subsequently folding the web in an opposite direction along a center line, and a second folding mechanism adapted to engage the web and produce a transverse zigzag fold thereon.

13. In an apparatus of the character de-

scribed, in combination, a folding mechanism including a V-shaped plate for folding the web longitudinally, said plate being divided into two parts, and means for adjusting said parts whereby the central line of the web may be made to coincide with the apex of the plate.

14. In an apparatus of the character described, in combination, a folding mechanism including a V-shaped plate for folding the web longitudinally, said plate being divided into two parts, means for adjusting said parts whereby the central line of the web may be made to coincide with the apex of the plate, and a second folding mechanism for subsequently engaging the web and producing thereon a continuous transverse zigzag fold.

15. In an apparatus of the character described, in combination, means for coating and printing a web on its opposite sides, means for perforating the web in parallel lines in the direction of its length, and means for folding the web along the perforated lines whereby a coated surface is positioned between each pair of printed surfaces, thereby permitting a plurality of manifold copies to be made.

16. In an apparatus of the character described, in combination, means for printing and coating a web of paper in parallel sections upon its opposite sides, means for folding said web in the direction of its length with a coated surface between each pair of printed surfaces, and means for folding said web transversely whereby the same may be conveniently handled.

In testimony whereof I affix my signature, in the presence of two witnesses.

LOUIS F. HAGEMAN, JR.

Witnesses:
WALTER GREIG,
PETER V. KELLER.