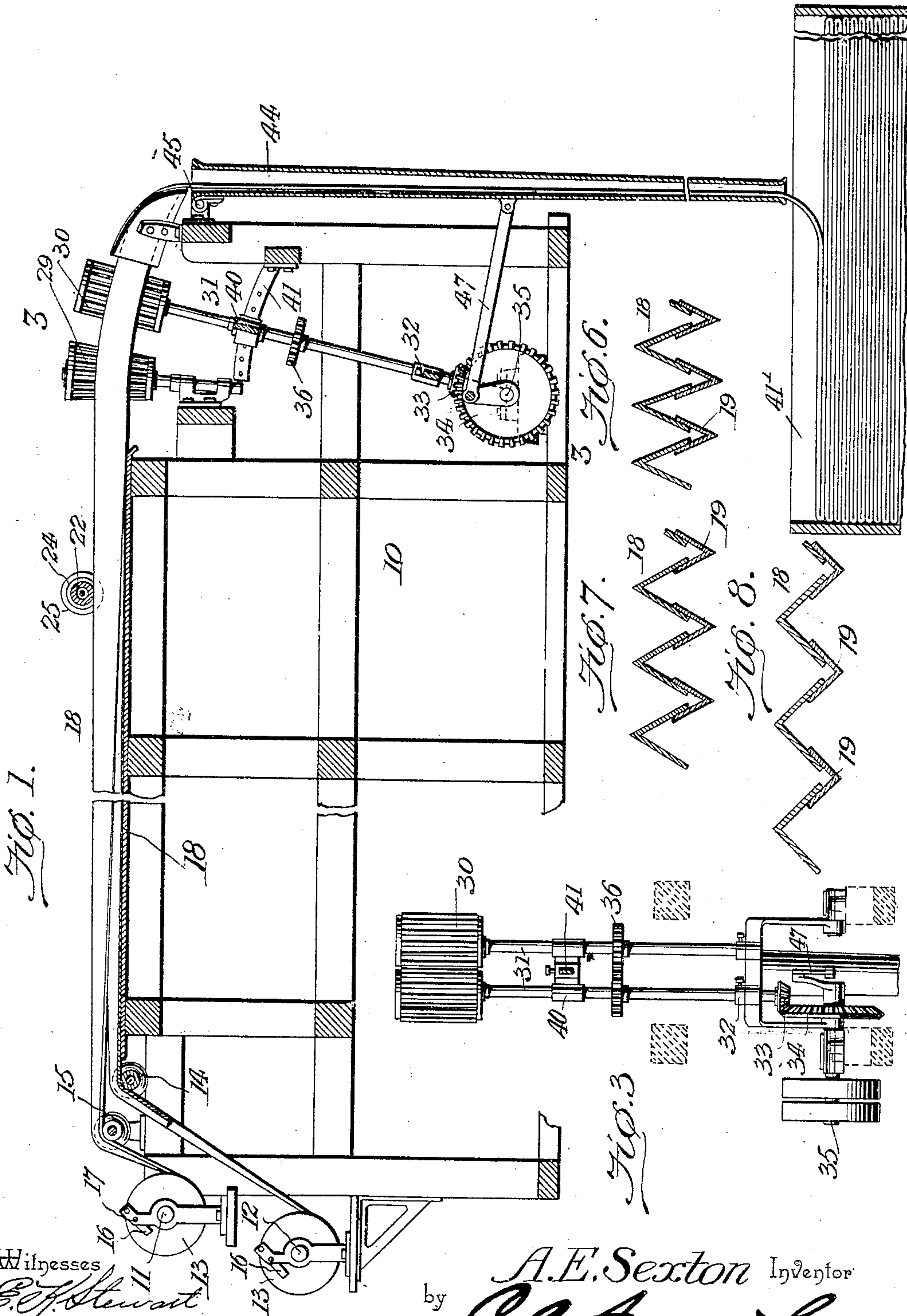


No. 778,462.

PATENTED DEC. 27, 1904.

A. E. SEXTON.
PAPER FOLDING MACHINE.
APPLICATION FILED MAR. 11, 1903.

4 SHEETS—SHEET 1.



Witnesses
E. F. Stewart
J. M. C. Carter

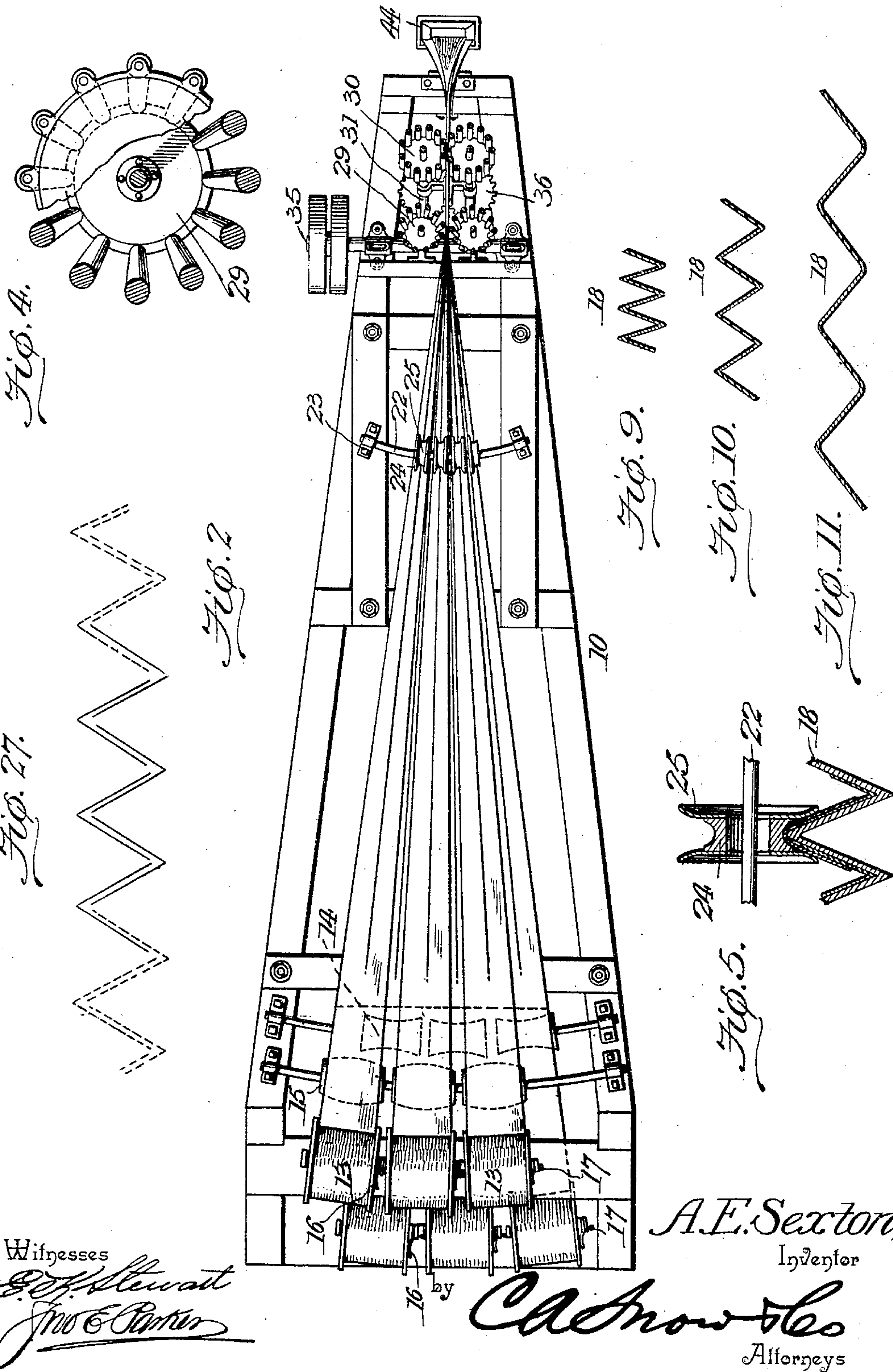
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4 SHEETS—SHEET 2.



Witnesses
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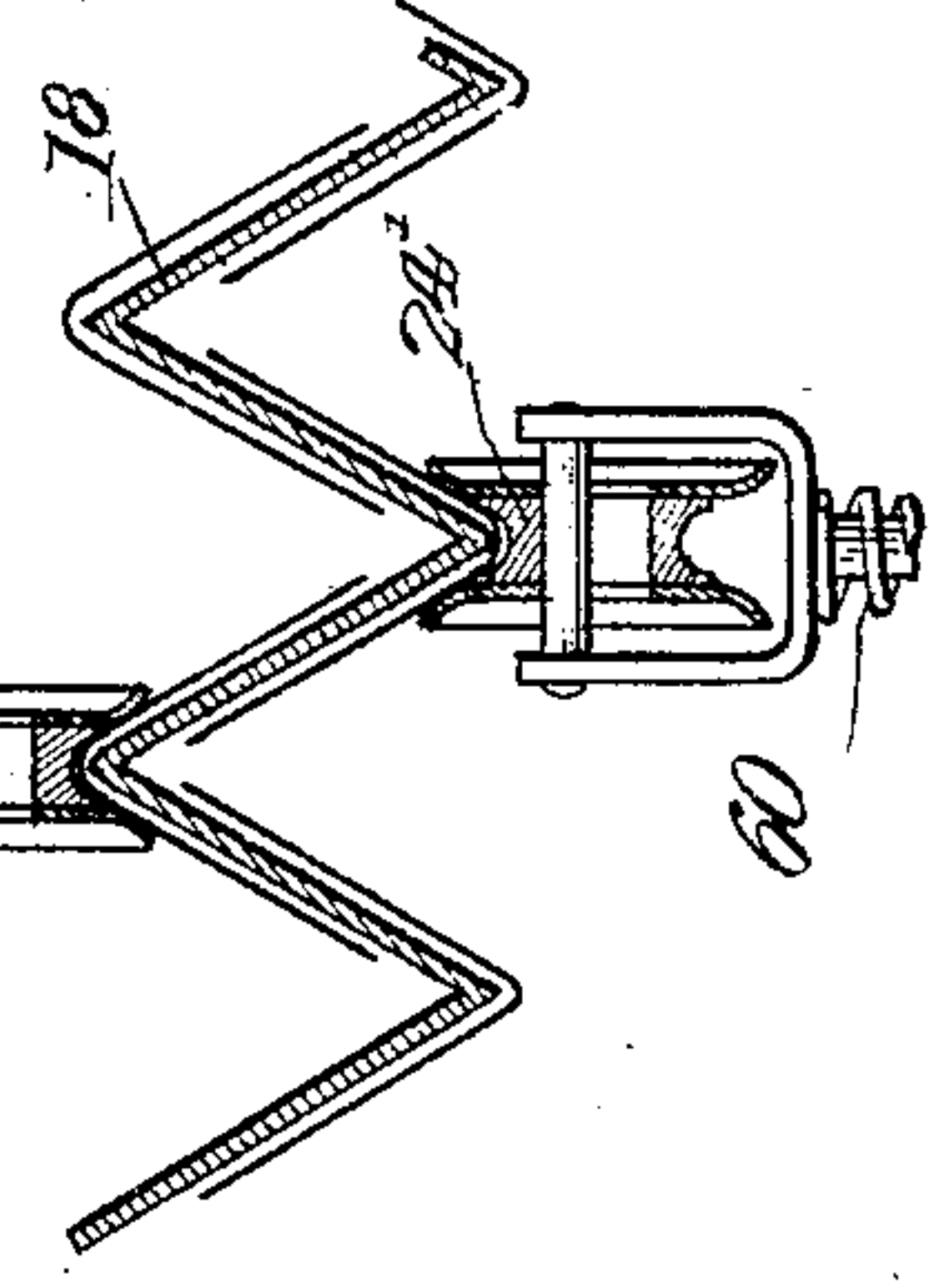
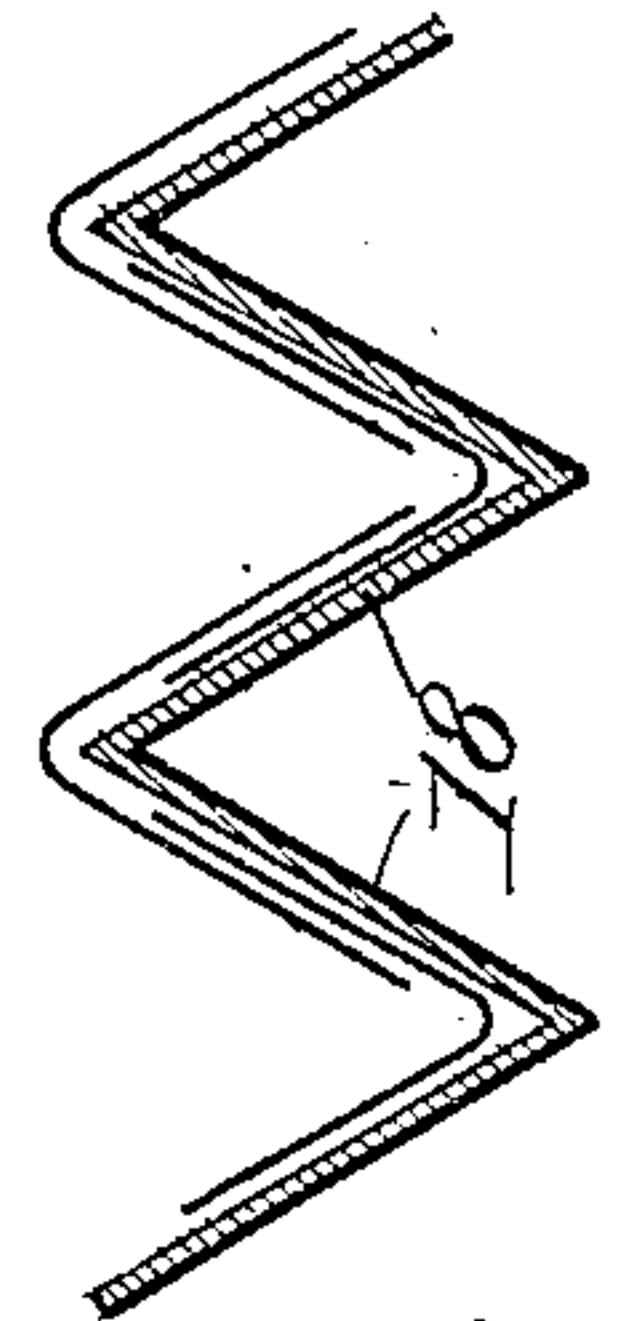
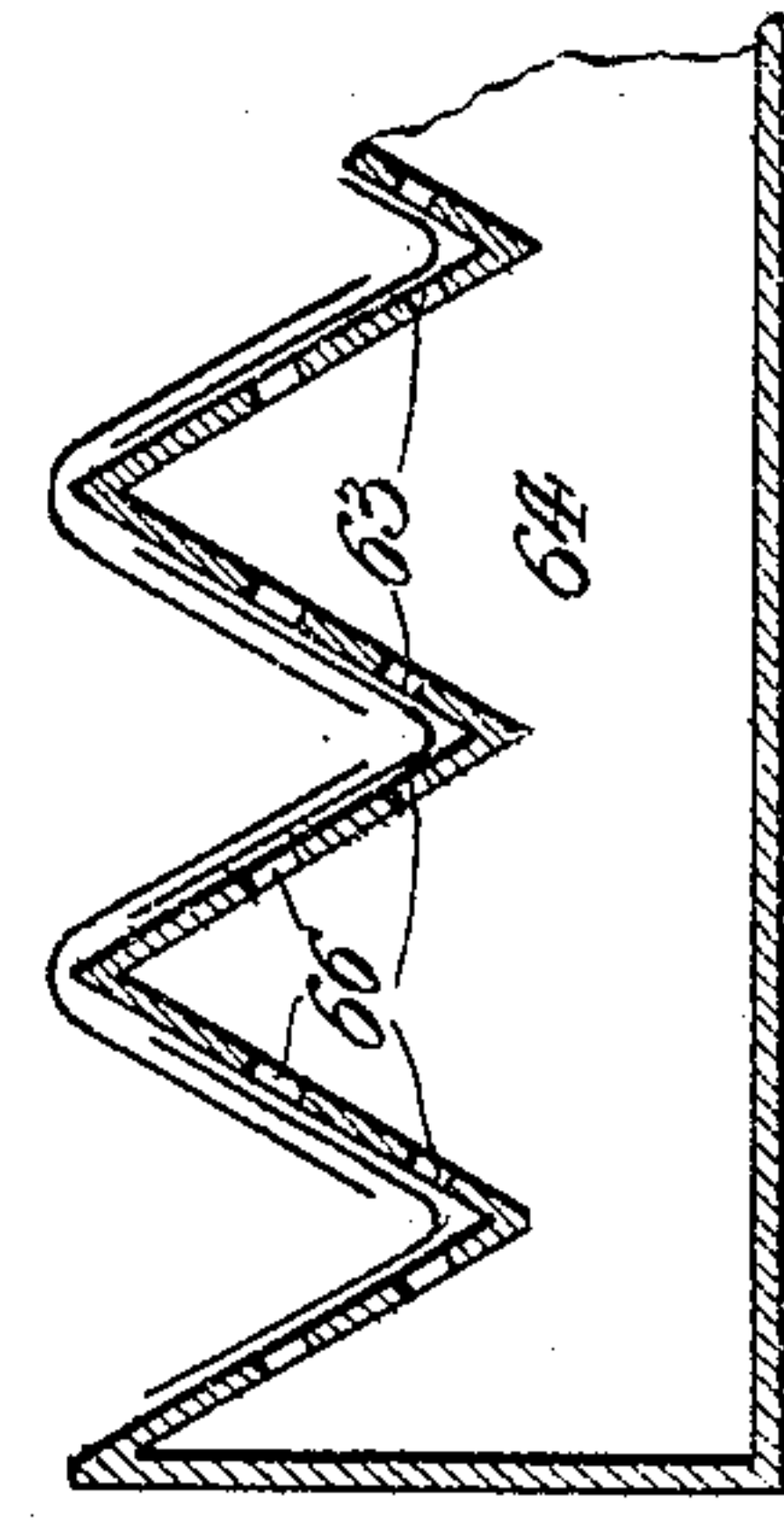
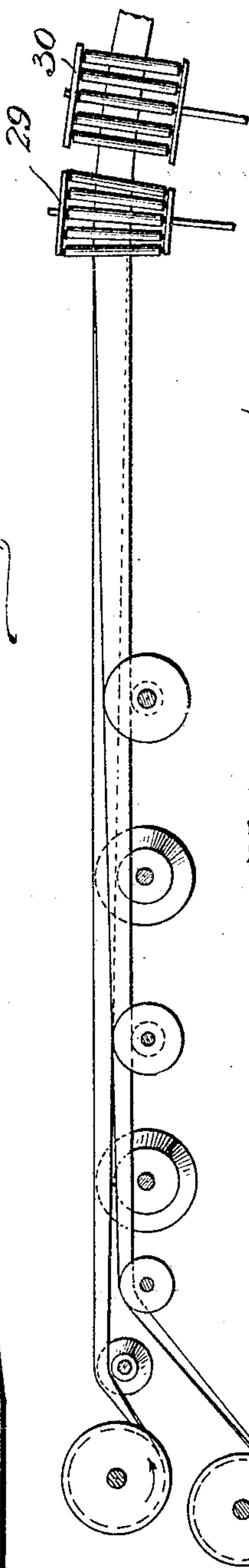
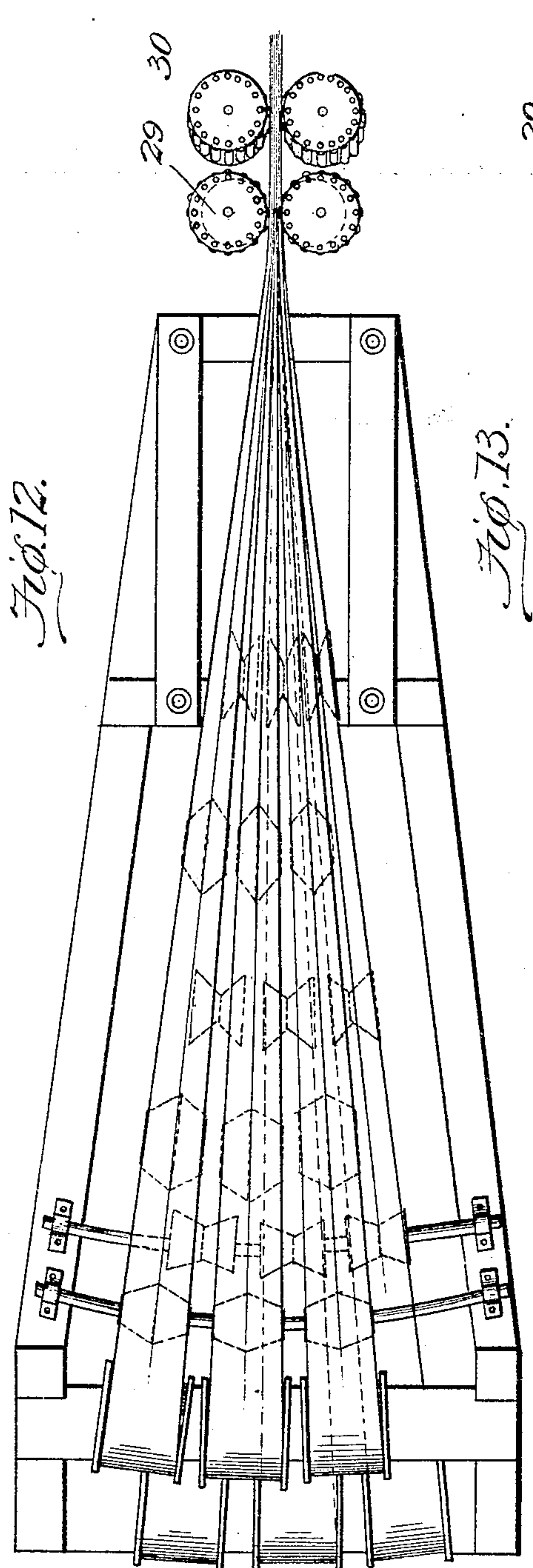
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4 SHEETS—SHEET 3.



Witnesses
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J. W. Parker

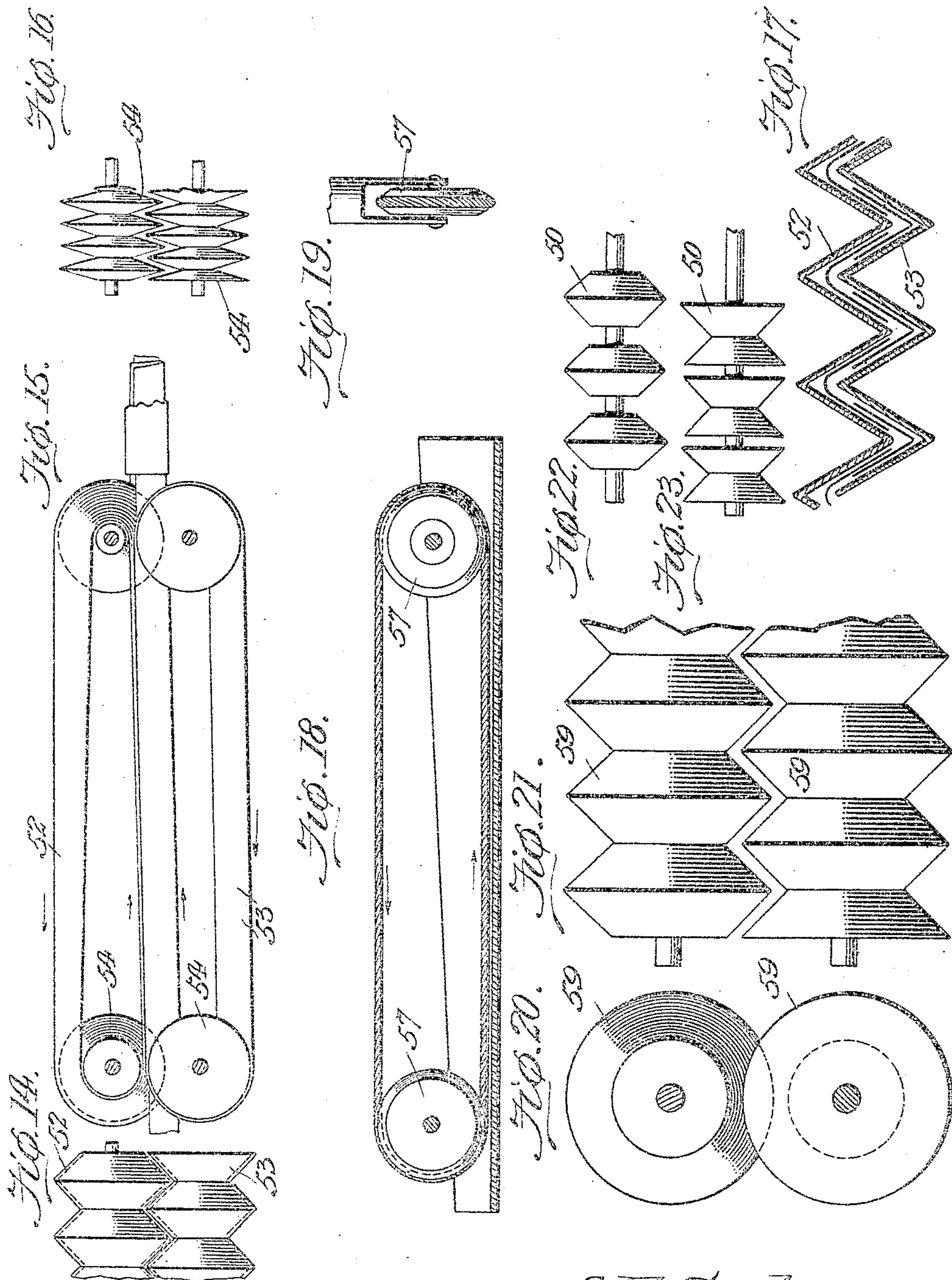
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4 SHEETS—SHEET 4.



Witnesses
E. J. Stewart
John C. Carter

by *A. E. Sexton*, Inventor:
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UNITED STATES PATENT OFFICE.

ARTHUR E. SEXTON, OF LOS ANGELES, CALIFORNIA.

PAPER-FOLDING MACHINE.

SPECIFICATION forming part of Letters Patent No. 778,462, dated December 27, 1904.

Application filed March 11, 1903. Serial No. 147,332.

To all whom it may concern:

Be it known that I, ARTHUR E. SEXTON, a citizen of the United States, residing at Los Angeles, in the county of Los Angeles and State of California, have invented a new and useful Paper-Folding Machine, of which the following is a specification.

This invention relates to certain improvements in paper-folding machines, and has for its principal object to provide a device for interfolding sheets of paper, more especially for toilet use, the paper being so arranged in packages that the withdrawal of each sheet will present the edge of the next sheet in convenient position to be grasped by the user.

A further object of the invention is to provide for the interfolding of a large number of sheets by providing a mechanism for forming continuous folds in elongated strips in such manner as to avoid danger of tearing the paper and providing for the formation of a continuous web comprising any desired number of interfolded strips to be afterward cut into sheets of proper size.

With these and other objects in view the invention consists in the novel construction and arrangement of parts hereinafter described, illustrated in the accompanying drawings, and particularly pointed out in the appended claims, it being understood that various changes in the form, proportions, and minor details of the structure may be made without departing from the spirit or sacrificing any of the advantages of the invention.

In the accompanying drawings, Figure 1 is a longitudinal sectional elevation of a folding-machine constructed in accordance with the invention. Fig. 2 is a plan view of the same. Fig. 3 is a transverse sectional elevation of the machine on the line 3 3 of Fig. 1. Fig. 4 is a plan view, partly in section, of one of the reels employed in guiding and straightening the folded strips. Fig. 5 is a detail section of a portion of the machine, showing one of the grooved rollers for assisting the folding operation. Figs. 6, 7, and 8 are detail sectional views showing the varying cross-sectional contour of the stationary folding member. Figs. 9, 10, and 11 are similar views illustrating a slight modification of con-

struction. Fig. 12 is a plan view illustrating a modified construction of the machine. Fig. 13 is a longitudinal sectional elevation of the same, the frame being omitted. Figs. 14, 15, and 16 illustrate a further modification, in which a pair of movable belts are employed to effect the preliminary folding of the strips. Fig. 17 illustrates a further modification of the folding means. Figs. 18 and 19 illustrate a still further modification, in which a movable cord is employed to assist in the folding operation. Figs. 20 and 21 illustrate a further modification also embodying the invention and in which a pair of grooved rollers are employed to effect a positive folding of the strips. Figs. 22 and 23 illustrate further modifications of the folding means, the rollers shown being similar to those employed in the machine shown in Figs. 12 and 13. Fig. 24 illustrates a slight modification of the invention, the strips of paper to be interfolded being arranged partly above and partly below the fixed folding member. Fig. 25 illustrates a still further modification of the invention, in which a jet of air is employed to assist in holding the paper in position. Fig. 26 illustrates a method of holding the paper in place by suction, the folding plate or plates being provided with perforations of any suitable shape and the air-pressure under said folding member being reduced in order that the strips of paper may be held in position by atmospheric pressure. Fig. 27 is a diagram illustrating the general method of interfolding the paper strips.

Similar numerals of reference are employed to indicate corresponding parts throughout the several figures of the drawings.

The mechanism is designed for the production of interfolded strips of the character shown in Fig. 23, each strip being bent in half, so as to form two leaves or wings, the bent portions of alternate leaves being disposed in opposite directions and the leaves being interfolded, so that when a number of sheets cut from interfolded strips of this character are placed in a paper-holder of proper construction they may be consecutively withdrawn in the well-known manner. Paper bundled in this manner is of particular value for toilet

purposes, for the wrapping of oranges and other fruits, caramels, candies, and generally where light tissue-paper or wax-paper is employed for wrapping or other purposes, and it may also be employed to advantage in connection with cigarette-papers or in other places where it is desired to facilitate the discharge or withdrawal of single sheets.

In the proper carrying out of the invention it has been found desirable to employ a movable or yieldable die member, and this element may take many forms, but in all cases should be freely movable or yieldable in order that paper being operated upon may be maintained in proper position and folded without danger of tearing, and while it is a matter of but little difficulty to interfold strips of paper or other fabric of heavy texture the light flimsy paper used for toilet and wrapping purposes cannot be handled without considerable risk of tearing, especially where the mechanism is operated at the speed necessary for operation on a commercial scale.

In carrying out the present invention, therefore, one of the principal objects in view is to permit the manufacture of webs or bundles of interfolded strips of very light and flimsy paper without danger of tearing and without the use of positively-fixed drawing-dies, it being deemed necessary from a practical standpoint that one or both of the paper-folding means shall be movable or yieldable and without exerting any direct positive folding action on the strips.

Referring to the drawings, 10 illustrates the general framework of a folding-machine, preferably formed of cast metal and provided at one end with a plurality of journal-bearings for the reception and support of shafts 11 and 12. These shafts, which may be of any number, serve as supports for paper-reels 13, or the shafts and reels may be integral, so that when a reel is empty it may be readily removed from place and a filled reel substituted, the journal-boxes in such cases being suitably constructed for the purpose. The reels are arranged in upper and lower sets and, as before stated, may be of any desired number, six being shown in the present instance, and these are arranged in an upper set of three and a lower set of three. The strips of the lower set are guided over concave rollers 14, and the strips of the upper set are guided in similar manner over convex rollers 15 in order to effect the preliminary bending of the paper, the object being to effect a gradual bending in order to avoid danger of tearing the paper. The reels are held from too free movement by means of small springs 16, which bear against one of the end disks of each reel and are adjustable by means of screws 17 to offer more or less frictional resistance to the turning movement of said reels.

At the top of the frame is a paper-folding element 18 of sector-like form in general con-

tour, and this element may be in the form of a block having its upper surface corrugated in order to form alternate ridges or ribs and spaces, or, as illustrated in the drawings, this member is preferably in the form of a number of plates of sheet metal for convenience in manufacture. Each of the plates, as illustrated in Figs. 6, 7, and 8, is in the form of an inverted V in cross-section, the shape varying at different points in the length of the plate, and the lower edges of said plates are preferably spaced from each other for a short distance, as in practice it is found that the best results are obtained when the bottoms of the grooves are open, although the plate may be formed of a continuous piece of metal or the lower edges of the plates connected to form a folding member of the character generally shown in Figs. 9, 10, and 11. Where such bent plates are used, it is preferred to place under each of the grooves a V-shaped plate 19 in order to prevent the passage of the strips of material between the plates, these auxiliary plates 19 being disposed a slight distance below what would otherwise be the bottom portion of the groove, and when the machine is properly operating the paper is not in contact therewith; but if from any cause the paper being folded should be drawn down through the groove these auxiliary plates will throw the paper up again into the proper position, and as the strips travel at a comparatively high rate of speed the contact will in most cases be but momentary, and will thus not add to the friction on the paper. At the outer ends of the plates the height of the ribs is comparatively small, while toward the opposite or discharge end of said plates the sides converge and the height of the ribs is gradually increased, while the spaces between said ribs grow less in width until at the discharge end they assume the shape shown in Fig. 6.

The strips of paper from the upper set of reels after passing over the convex rollers pass onto the ribs of the plate, while the strips from the lower reels are directed after passing over the concave rollers to the spaces between said ribs, the two leaves formed by the bending of the upper strips overlapping the similar leaves formed by the upbending of the lower strips.

As shown in Fig. 1 of the drawings, the plate is arranged on a straight line, with its highest point adjacent to the narrowest and discharge end of said plate, so that the strips of paper will be held by tensional strain in contact with the entire surface of said plate. The bending of the paper is gradual, and there is little likelihood of tearing the strips if the frictional resistance is not excessive, and while any paper of coarse or comparatively strong texture may be bent by exerting sufficient tensional strain to effect the desired result it is preferred to assist in the bending by the employment of bending-rollers and

disks of the character best shown in Fig. 5, these being disposed at a point adjacent to the discharge end of the plate.

The shaft or spindle 22 is rigidly secured to brackets 23, projecting from the frame, and on said shaft are mounted rollers 24, the rollers being provided with central openings of much larger diameter than the shaft in order to permit considerable freedom of movement. These rollers have grooved peripheries, the grooves in cross-section being approximately semi-circular in form and fitting over the ribs of the plate and forcing the upper strips against the angular edges which form the ribs. The rollers to some extent act to form the central crease of the upper strips, but are intended principally to retain the strips in position on the ribs. The shaft or spindle also carries a pair of dished disks 25 at each side of each grooved roller, these disks bearing lightly against the strips of paper and serving to retain the same in proper position, and if the lower strips or those in the grooves between adjacent ribs have any tendency to ride up the inclined sides of said ribs this tendency will be corrected and the strips forced back to proper position.

At a point slightly beyond the discharge end of the plate is a pair of frusto-conical reels 29, which engage the web and serve in a measure to complete the folding of the paper, although these reels are intended more especially to assist in the interfolding operation and exert little or no pressure on the opposite sides of the web. The reels are idlers and are turned as the web is pulled from the folding-machine. As the larger diameter of each reel is uppermost, the reels will have a tendency to pull downwardly on the web, more particularly as the axes of said reels are arranged in an inclined plane, and will thus serve to hold the uppermost strips down into contact with the upper edges of the ribs, and so assist in completing the folding operation. Inasmuch as the axes of the reels are disposed at an oblique angle to the general plane of the folder, it is found that the downward stress exerted on the strips of paper or other material to be folded is such as to assist in the folding operation, and the strain exerted on the paper will be greatest at the apex of the ribs and at the lowest points of the grooves, inasmuch as downward movement of the paper at these points is limited, while on the sides of the ribs, the paper being to some extent movable laterally, the actual strain will not be so great, and it is found in practice that the friction between the paper and the folding member will gradually decrease from the middle of the strip toward its opposite sides. It is found in practice that between the discharge end of the plate and this set of frusto-conical reels there is a tendency of the upper strips or those shaped by the ribs to rise, the strips being separated to such an extent as to render it difficult to

form a neatly-folded web. This is corrected by the conical rollers, and the strips after passing between these reels are all properly interfolded.

At a point slightly beyond the reels 29 is a pair of reels 30, mounted on inclined shafts 31, the lower ends of which are carried in pivoted brackets 32 near the base of the machine, and on one of said shafts is a bevel-pinion 33, intermeshing with a bevel-gear 34, mounted on a revoluble shaft 35, and the two shafts are connected to each other by small gears 36 in order that they may simultaneously revolve in opposite directions. The positively-driven reels 30 are substantially cylindrical in form and positively engage with the web of paper, the web being crimped into spaces between the small rollers or pins which form each reel and insuring positive feed of the strips from the folding-machine, while at the same time the fold-lines are completed.

The two reel-carrying shafts pass through an intermediate bracket 40, which is supported by a segmental arm 41, secured to the frame of the machine and provided with a plurality of notches or openings for the reception of a locking-pin or similar device carried by the bracket, so that the degree of inclination of the shafts, as well as the distance between the cylindrical and conical reels, may be adjusted at will.

At the discharge end of the machine, at a point slightly beyond the two reels, is a vertically-disposed spout or tube 44, mounted at its upper end on pivot-pins 45 and adapted to receive the web from the reels. The lower end of the tube extends slightly into the upper portion of the receiving box or bin 41', and said tube is slowly oscillated by means of a crank-and-pitman connection 47, so that the interfolded web of paper is laid back and forth within the box in the manner best shown in Fig. 1. The length of the tube is governed by the length of the desired layers and the speed at which the web is delivered from the rollers.

In the construction shown in Figs. 12 and 13 the folding-plates are replaced by a plurality of sets of rollers 50, the rollers occupying relatively the same position as the folding plate or plates and the sets being of successively-decreasing width from the outer to the discharge end of the machine. In this case the operation remains the same or practically the same as the folding operation accomplished by means of the stationary plate or plates, and as there is no friction, owing to the free turning of the rollers, the strips of paper may be placed under somewhat greater tensional strain and the folding operation accomplished with less risk of tearing. In this construction the auxiliary grooved disk may be dispensed with, or it may be employed in connection with one or other of the sets of folding-rollers, as desired. In Figs. 14 and 15 is

illustrated a further modification, also embodying a movable folding element, and in this case a pair of belts 52 and 53, formed of rubber or other freely-flexible material, is employed. The belts take the place of the outer portion of the folding member shown in Figs. 1 and 2 and are guided over suitable ribbed and grooved rollers 54, the contour of said rollers varying in the same manner as that of the corresponding portions of the folding member whose place they take. The strips of paper to be folded are led between these rollers and both receive movement simultaneously in the same direction as regards their adjacent faces, the strips of paper being clamped between them and the positive folding of the strips commenced. As the belts could not practically be employed to complete the folding operation, they occupy only the place of the outer portion of the folding paper member, and the strips may be led from between the belts over a suitable binding member in the form of a plate or plates, or the rollers shown in Figs. 12 and 13 may be employed for the purpose.

In Figs. 18 and 19 is illustrated a further modification of the movable folding element, in this case comprising a plurality of cords formed of some freely-flexible material, said cords being guided over suitable rollers 57 and serving to hold the paper down in the lowermost portion of the grooves of the folding member.

In Figs. 20 and 21 is illustrated a still further modification, in which a pair of upper and lower grooved rollers is employed for contact with the opposite sides of the strips, said rollers 59 engaging and positively bending the strips, while both are turned either by the traction of the paper or by independent operating means.

Fig. 24 illustrates a slight modification from the structure shown in Figs. 1 and 2, and in this case the folding member is in the form of a ribbed and grooved or corrugated sheet of metal. Half of the strips of paper are led over the ribs or ridges on the upper side of the plate, while the opposite half is led under the plate in contact with the ribs or ridges, and in order to guide the strips properly additional grooved rollers 24' are placed under the plate and held up in contact with the strips by means of small springs 60. The strips of paper may be effectively folded by this means and are held out of contact with each other until near the completion of the folding operation, so that friction between the strips is materially reduced.

In Fig. 25 is illustrated a still further modification, in which the movable or grooved member takes the form of an air-jet or plurality of jets which issue from suitable nozzles 61, mounted directly above the ridges or ribs, and the air-jet mechanism may take the form of elongated pipes having discharge-slits co-

extensive with the ribs and serving to direct jets of air downwardly against the highest portions of the ribs. The strength of the jets may be tempered to suit requirements, the jet or jets being divided by the ribs and deflected downwardly into engagement with the strips of paper on both sides of said ribs.

In Fig. 26 is illustrated a further method of interfolding in which the movable or yieldable die member is formed by air atmospheric pressure. In this case the lower die-plate 63 forms the top of the box or chamber 64 and one end communicating with an air-exhausting apparatus of any suitable character. The die member is ribbed and grooved, as before, and provided with any desired number of perforations, as indicated at 66. This construction permits of the formation of a partial vacuum below the die member, so that the air under atmospheric pressure will hold the strips in close contact with said folding member, and the pressure thus exerted may be adjusted in accordance with the character of the paper.

While the machine forming the subject of the present invention may be employed for the folding of fabric or sheet material of any nature, it is intended principally for the folding of light and flimsy paper, such as is used for toilet-paper, and in operation it is found extremely difficult to retain the strips in proper position in the grooves and on the ribs of the folding-plate, (shown in Figs. 1 and 2,) the strips moving from side to side, especially where imperfections occur in the paper, so that the use of a continuous plate is practically necessary in order that the strips may be supported during the entire operation. This is especially true in the case of slightly-torn strips where the continuous support prevents the torn edges from falling and disarranging the fold-lines. The resultant product may be cut into proper size and the sheets interfolded to any desired extent for the production of bundles of marketable size.

While the machine illustrated in the drawings merely shows the interfolding of six strips of paper, it will be understood that the capacity of the machine may be increased indefinitely, so that the product as it passes from the two rollers may be in the form of a web of paper of a thickness equal to the marketable bundles which it is desired to produce, and any automatic mechanism may be employed to cut the web into sheets of suitable size. The interfolding of a small number of strips has been illustrated in order that the construction of the devices may be more clearly shown, and it is to be understood that the invention contemplates the interfolding of any number of strips.

While the web-engaging devices at the discharge end of the machine have been termed "reels" in order to define a structure comprising an annular row of spaced bars, it will

be understood that the term should be read to include fluted or grooved rollers of the same general character.

It will be noted that in each of the mechanisms illustrated there is included a movable, yieldable, or revoluble member, and these may all be properly classified as "variable," the term being used in the claims to cover a folding member capable of adjusting itself to varying conditions and which is not under all circumstances positive and unyielding in its action.

In claim 1 the term "mutable or variable" has been used to designate a member that is changeable or is free to move in two directions in accordance with varying conditions.

Having thus described the invention, what is claimed is—

1. In a machine for interfolding a plurality of strips, the combination with a main folding member, of an auxiliary mutable or variable folding means tending to correct lateral displacement of the strips and operating simultaneously on a plurality of said strips.

2. In a strip-interfolding machine, the combination with a ribbed and grooved folding member, of a traction means arranged at an oblique angle thereto and serving to hold the material to be folded in contact with said folding member.

3. In a strip-interfolding machine, the combination with a fixed ribbed and grooved folding member, of a feeding means disposed at an angle thereto to thereby exert differential strain on different portions of the width of the strips.

4. The combination in a strip-interfolding machine, of a ribbed and grooved folding member, and a feeding means for drawing the material to be folded across said member, said feeding means being disposed at an oblique angle to the folding member.

5. The combination in a strip-interfolding machine, of a ribbed and grooved folding member, and a traction means disposed at the discharge end thereof at an oblique angle to the folding member and serving while exerting a drawing strain on the material to hold the latter in contact with said folding member.

6. The combination in a strip-interfolding machine, of a ribbed and grooved folding member, a traction means, and loosely-mounted freely-movable auxiliary folding means between the end of the folding member and the traction means for holding the strip of material to be folded in engagement with the said folding member.

7. In a machine for interfolding a plurality of strips of material in the form of a web, a traction means for engaging said strips and drawing the same over the folding member, said traction means engaging the material in a plane below the general plane of the folding member and being disposed in a plane at other

than a right angle to the plane of movement of the strips during the folding operation.

8. In a machine for interfolding strips of material, a ribbed and grooved folding member, and a pair of revoluble feeding or drawing members engaging the strips of material at the discharge end of the machine and arranged in a plane below and with their axes at other than a right angle to the general plane of movement of the strips being folded.

9. In a strip-interfolding machine, a ribbed and grooved folding member, and a loosely-mounted auxiliary member coacting therewith and free to move both away from and laterally with respect to said member.

10. In a strip-interfolding machine, a folding member having a plurality of ribs and grooves, and a secondary member movable by engagement with the material to be folded, said secondary member being supported by the folding member.

11. In a strip-interfolding machine, a ribbed and grooved folding member, and an auxiliary member movable by the traction of the material to be folded, said auxiliary member being supported by the folding member.

12. In a strip-interfolding machine, a ribbed and grooved folding member, and an auxiliary movable member mounted thereabove, said auxiliary member being engaged and moved by the material to be folded and being supported by said folding member.

13. In a strip-interfolding machine, a ribbed and grooved folding member, and an auxiliary revoluble member coacting therewith and supported by said folding member.

14. In a strip-interfolding machine, a ribbed and grooved folding member and a revoluble member coacting therewith and movable by the tractile force of the material being folded, the weight of the revoluble member being borne by said folding member.

15. In a strip-interfolding machine, a ribbed and grooved folding member, and a revoluble auxiliary member engaged and movable by the material being folded, said auxiliary member being freely movable toward and from the folding member and having free lateral play with respect thereto.

16. In a strip-interfolding machine, a ribbed and grooved folding member and a gravital auxiliary member resting thereon and forcing the material to be folded into contact therewith, said gravital member having free lateral play and being freely movable toward and from said folding member.

17. In a folding-machine, a ribbed and grooved folding member for interfolding strips of material, loosely-mounted grooved rollers riding on the tops of the ribs and free to move toward and from and laterally with respect thereto, and auxiliary disks at each side of each of the grooved disks for engagement with the material.

18. In a folding-machine, a ribbed and grooved folding member for interfolding strips of material, loosely-mounted grooved rollers riding on the tops of the ribs and free to move toward and from and laterally with respect thereto, and dished disks disposed on each side of each grooved disk for engagement with the material.

19. In a folding-machine, a ribbed and grooved folding member, and convexed and concaved rollers adapted for independent engagement with the strips to be folded and serving to partly bend the same before they make contact with the folding member.

20. In a strip-interfolding machine, a folding member having a plurality of alternate ribs and depressions convergent from the feed to the discharge end, and revoluble members for engaging the strips and pressing the same against the surface of said member, the axes of said members being disposed in a curved line struck from the point of convergence.

21. In a strip-interfolding machine, a folding member provided on one face with alternate ribs and grooves convergent from the feed to the discharge end, revoluble members for engaging the strips and pressing the same against the folding member, and means for engaging the strips and drawing the same over the folding member.

22. In a strip-interfolding machine, a folding member having on one face a plurality of alternate ribs and depressions convergent from the feed to the discharge end, means for effecting a preliminary bending of the strips to be folded prior to the movement of the strips into contact with said member, and means for drawing said strips from end to end of said member.

23. In a strip-interfolding machine, a ribbed and grooved member in which the ribs and grooves are convergent from the feed to the discharge end of the plate, and crimping-reels arranged at the discharge end of the plate and serving to draw strips of material across the plate and to partly crimp and condense the folded strips into the form of a web.

24. In a strip-interfolding machine, a ribbed and grooved folding member in which the ribs and grooves are convergent from the feed to the discharge end of the member, and a pair of reels of frusto-conical form disposed at the discharge end of the folding member and engaging said strips.

25. In a strip-interfolding machine, a folding member provided on one face with alternate ribs and grooves convergent from the feed to the discharge end, means for engaging strips and drawing the same over the folding member, and a pair of conical rollers arranged between the discharge end of the plate and the strip-engaging means.

26. In a strip-interfolding machine, a folding member provided on one face with alternate ribs and grooves convergent from the

feed to the discharge end, a pair of rollers or reels for engaging strips and drawing the same over the folding members, and a pair of conical rollers engaging said strips in advance of the drawing-rollers.

27. In a strip-interfolding machine, a folding member provided on one face with alternate ribs and grooves convergent from end to end, reels for engaging strips of material folded by said member and drawing the same thereover, and idler reels of conical form engaging the opposite sides of the material in advance of the drawing-reels.

28. In a strip-interfolding machine, a folding member provided on one face with alternate ribs and grooves convergent from end to end, a pair of driven reels for engaging and crimping a web formed of strips of material interfolded by said member, and a pair of idler reels of frusto-conical form engaging the opposite sides of the web in advance of the driven reels.

29. In a folding-machine, a folding member provided on one face with convergent ribs and grooves, and a pair of conical reels arranged at the discharge end of the machine for engaging a web formed of strips interfolded by said member, the axes of said rollers being disposed at other than a right angle to the plane of said folding member.

30. In a strip-interfolding machine, a folding member provided on one face with convergent ribs and grooves arranged in a substantially horizontal plane, and a pair of conical reels arranged at the discharge end of the machine for engaging the web formed of strips interfolded by said member, the larger diameters of said reels being uppermost and the axes of said reels being disposed at other than a right angle to the horizontal plane of the folding member.

31. In a strip-interfolding machine, a ribbed and grooved folding member in which the ribs and grooves are convergent from the feed to the discharge end of the member, and a pair of reels disposed at the discharge end of said member, said reels being provided with a plurality of spaced bars which slightly intermesh to engage strips of material interfolded by said plate and condense said strips into the form of a web.

32. In a strip-interfolding machine, a ribbed and grooved folding member in which the ribs and grooves are convergent from the feed to the discharge end, and a pair of reels arranged at the discharge end of said member for engaging strips interfolded by the latter, said reels being adjustable to vary the angular relation of their axes to the general plane of the folding member.

33. In a strip-interfolding machine, a ribbed and grooved member in which the ribs and grooves are convergent from the feed to the discharge end, means for drawing strips of material across said member, a spindle mount-

ed above the member, and a plurality of alternately-disposed disks and grooved rollers for engaging the strips of material at a point near the discharge end of the member.

5 34. The combination in a folding-machine, of a ribbed and grooved folding member in which the ribs and grooves are convergent from the feed to the discharge end, and reels disposed at the discharge-end of the member
10 for engaging the web of folded strips, said reels being frusto-conical in form.

35. The combination in a folding-machine, of the folding member having alternate ribs and grooves in which the ribs and grooves
15 converge from the feed to the discharge end, means coacting with the folding member to fold strips of material, and a pair of sets of reels arranged at the discharge end and at an angle to each other and adapted for successive
20 engagement with the web of folded strips.

36. The combination in a folding-machine, of a ribbed and grooved plate in which the ribs and grooves are convergent from the feed to the discharge end of said plate, alternately-
25 disposed grooved rollers and disks arranged above the plate and adapted to press upon the strips of material being folded, a pair of reels arranged at the discharge end of the plate and adapted to engage the web formed by the
30 folded strips and serving also as a feeding

means for drawing the strips across the plate, a plurality of preliminary-bending rollers adapted to engage the strips before the latter makes contact with the plate, and a pivotally-mounted spout adapted to deposit the web in
35 superposed layers.

37. In a strip-interfolding machine, a folding member formed of a plurality of angularly-bent plates, the lower edges of adjacent plates being spaced from each other.
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38. In a strip-interfolding machine, a folding member comprising a sector-like plate bent or convoluted to form alternate ribs and grooves, the bottom portions of the walls of the grooves being offset in a plane beyond the
45 general angular plane of the upper portion of said walls.

39. In a strip-interfolding machine, a folding member formed of a series of angularly-bent plates, the lower edges of adjacent plates
50 being spaced, and auxiliary angularly-bent plates bridging the spaces.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two witnesses.

ARTHUR E. SEXTON.

Witnesses:

J. ROSS COLHOUN,
C. E. DOYLE.