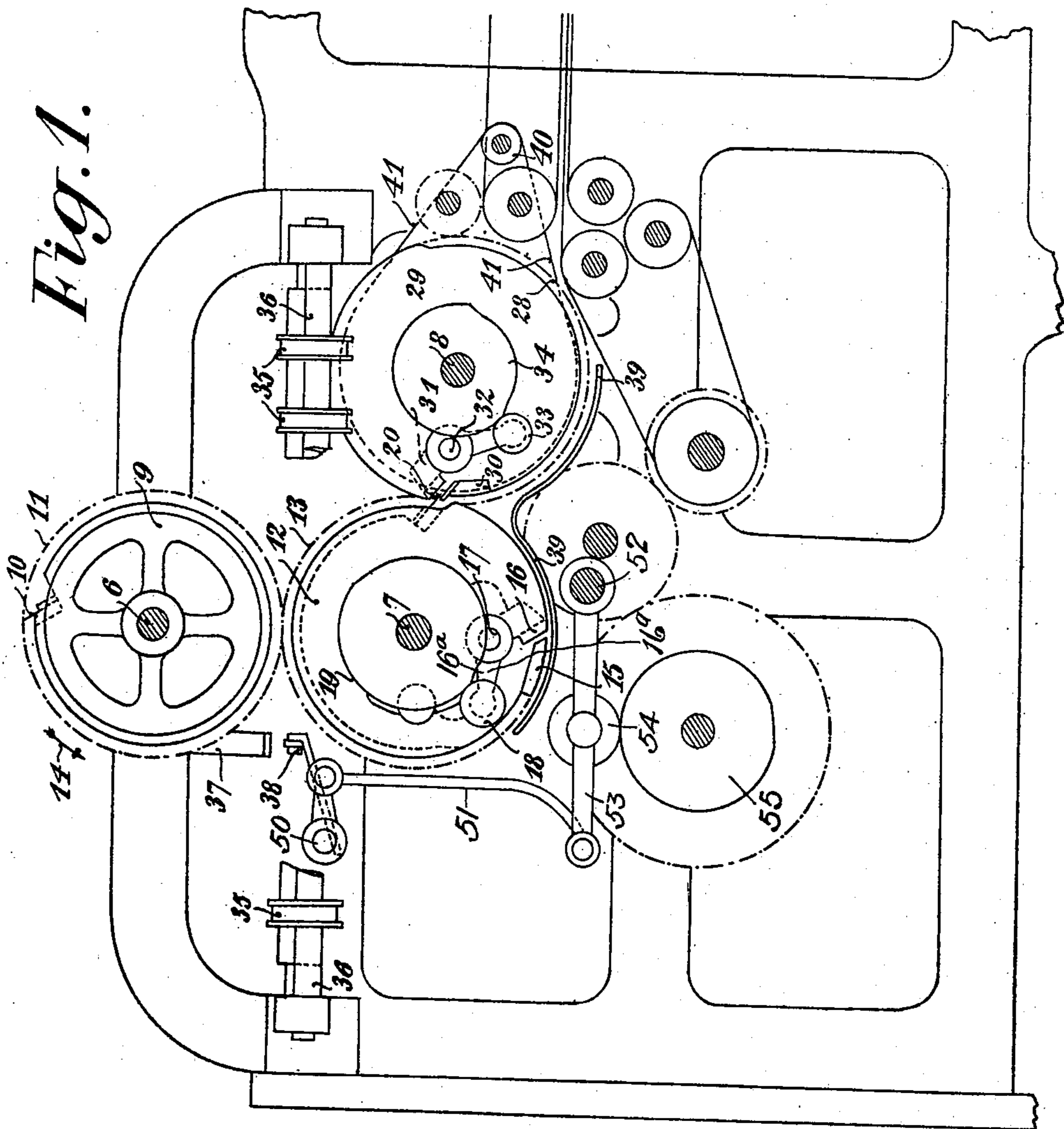


B. J. JENSEN.
PAPER FOLDING MACHINE.
APPLICATION FILED OCT. 21, 1909.

980,871.

Patented Jan. 3, 1911.

2 SHEETS—SHEET 1.



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2 SHEETS—SHEET 2.

Fig. 2.

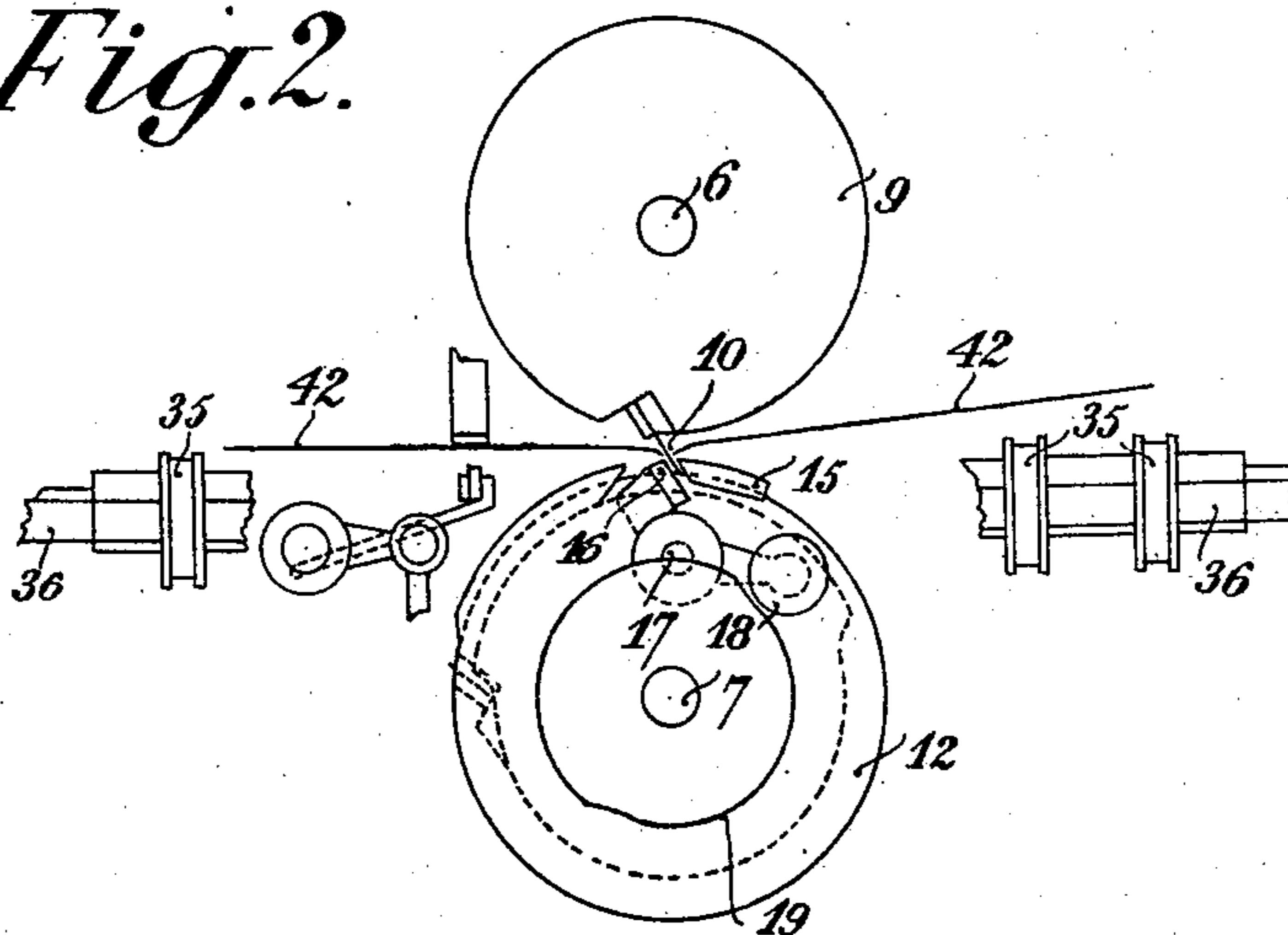


Fig. 3.

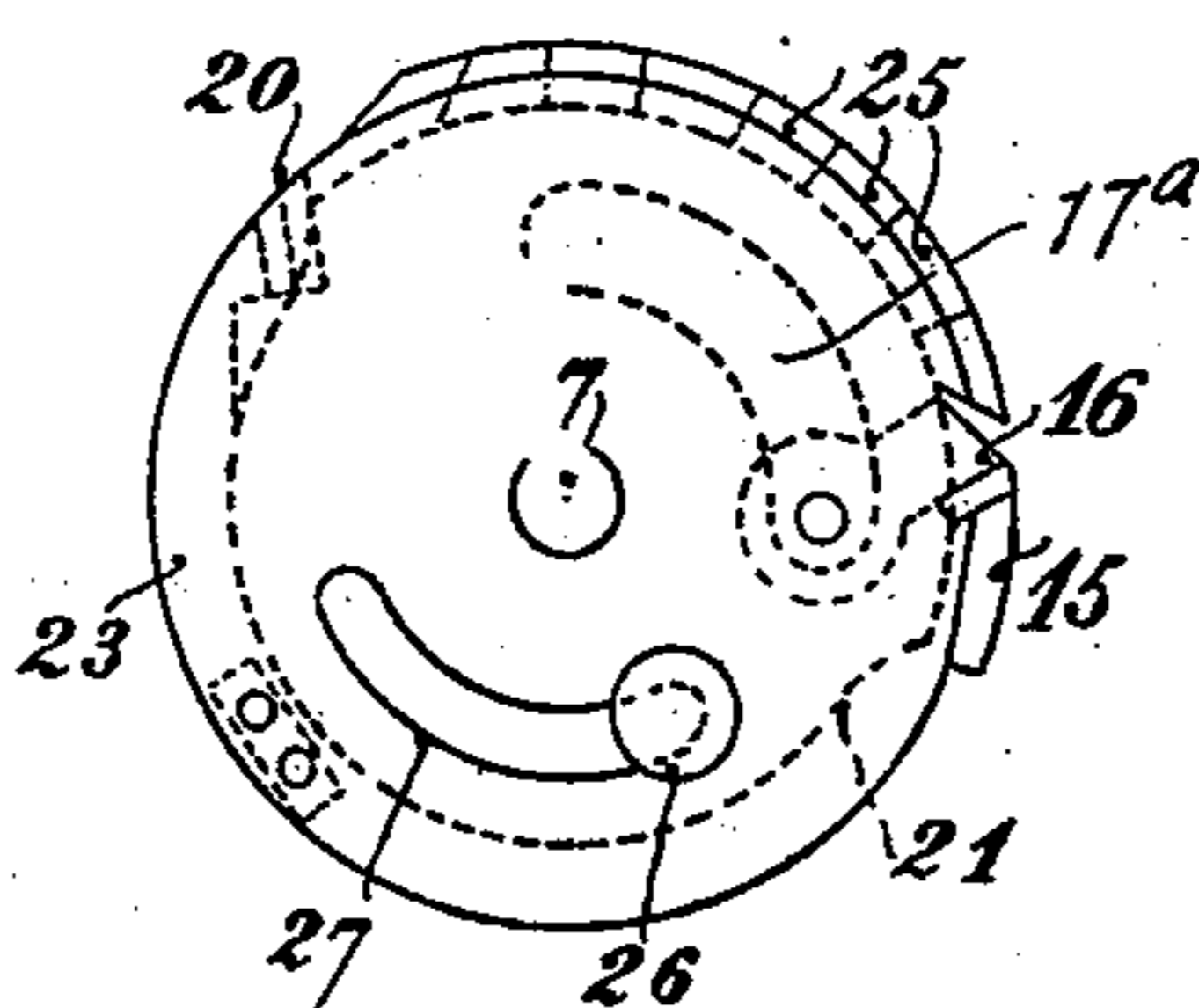


Fig. 4.

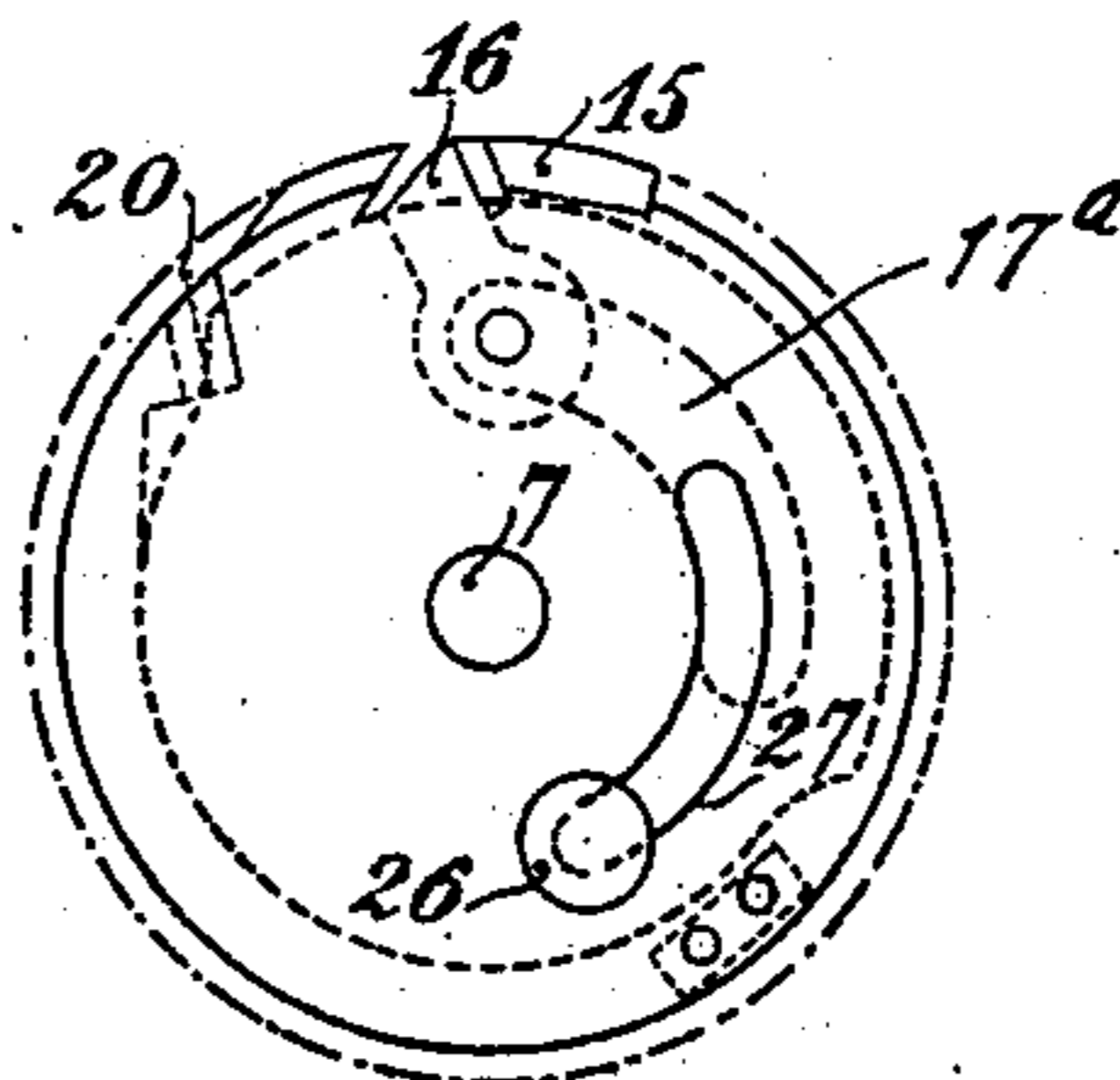
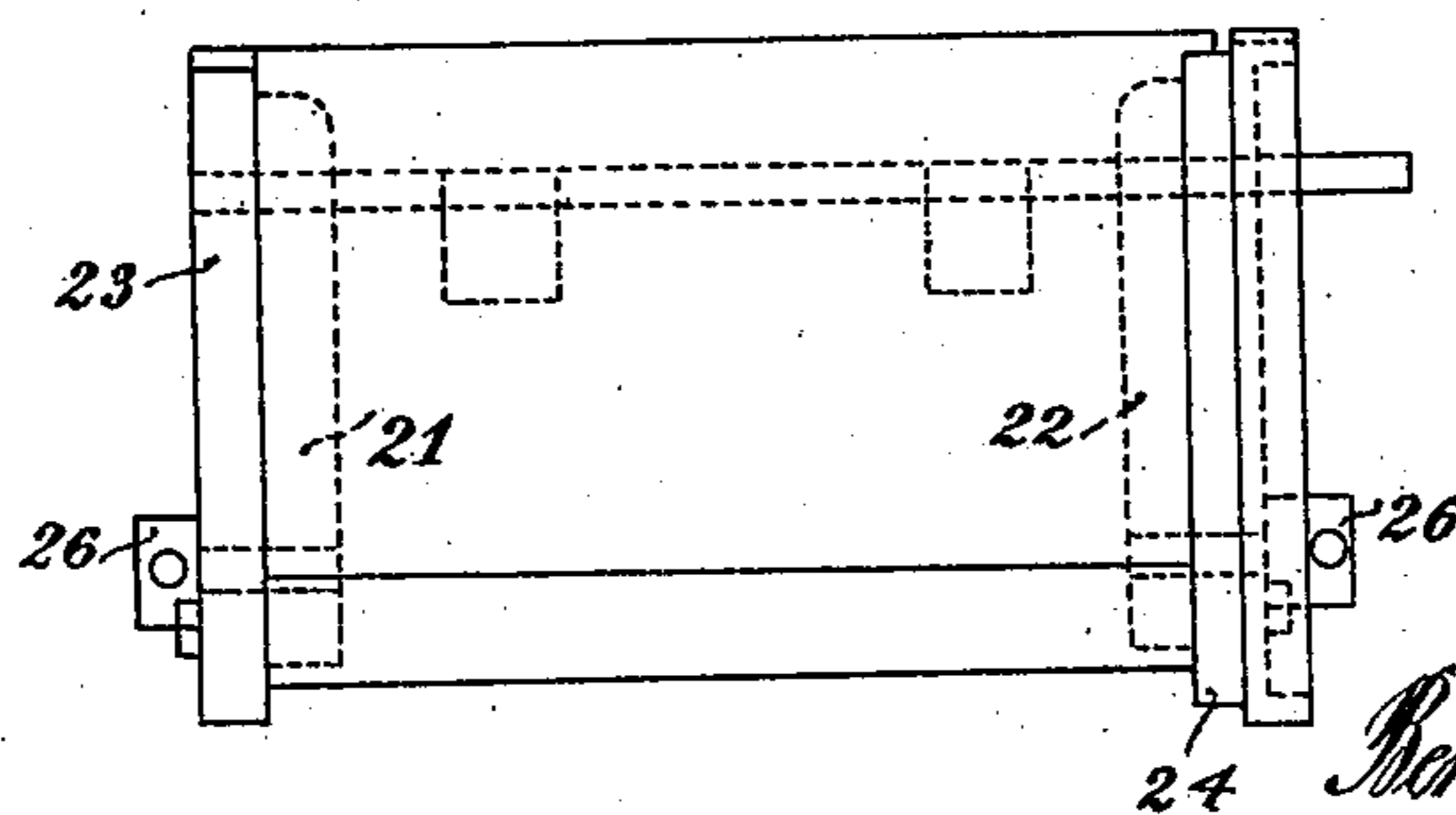


Fig. 5.



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BERNHARDT JOHAN JENSEN, OF FREDERIKSBURG, NEAR COPENHAGEN, DENMARK.

PAPER-FOLDING MACHINE.

980,871.

Specification of Letters Patent.

Patented Jan. 3, 1911.

Application filed October 21, 1909. Serial No. 523,964.

To all whom it may concern:

Be it known that I, BERNHARDT JOHAN JENSEN, of Frederiksberg, near Copenhagen, in the Kingdom of Denmark, have invented
5 new and useful Improvements in Paper-Folding Machines, of which the following is a specification.

This invention is a folding machine to be used in manufacturing capsules, paper-bags,
10 envelopes and the like, and it consists of a simple and easily adjustable mechanism, by means of which the same machine can be made to produce capsules, paper-bags, envelopes and the like of any desired size.

15 A constructional form of the invention is shown in the accompanying drawing, in which—

Figure 1 represents a vertical section through the machine, Fig. 2 shows partly
20 diagrammatically a step in the operation of the machine, Figs. 3 and 4 are end views of a folding cylinder in different positions of adjustment, and Fig. 5 is a side elevation of the folding cylinder.

25 The machine as illustrated operates upon previously cut sheets; it folds the sheets in the middle, bends the fold along one of the sides and lastly bends the fold along the edge of the bag.

30 As the mechanism which applies the adhesive does not come within the scope of this invention, a description of this part of the mechanism is omitted.

As shown in Fig. 1 the frame of the machine carries three horizontal shafts 6, 7 and
35 8. To the shaft 6 is fastened a cylinder 9 provided on its surface with an obliquely projecting, horizontally extending folding-knife 10, and at its end with a gear wheel 11. On the shaft 7 is rotatably mounted a cylinder 12 provided with a gear-wheel 13 engaging the gear wheel 11. These wheels
40 have the same number of teeth. For each rotation of the cylinder 9 and the gear-wheel 11, in the direction shown by the arrow 14, the folding-knife 10 is carried into a folding-slot on the drum 12, said slot being formed by a fixed jaw 15 and a movable jaw 16 the latter of which is secured at opposite
45 ends to elbow levers 16^a pivotally mounted on the spindle 17 movably mounted on the end walls of the cylinder 12. The movement of the jaw 16 is caused by a roller 18 carried by the elbow lever 16^a and which, when the
50 cylinder 12 revolves, moves along the edge of a fixed guiding cam-disk 19 of such a shape,

that the jaw 16 is forced against the jaw 15 immediately after the knife 10 leaves the jaws, whereupon the jaws only open when the cylinder 12 assumes the position
60 shown in Fig. 1. The cylinder 12 is moreover supplied with a folding-knife 20 exactly like the above described folding-knife 10.

As shown in Figs. 2 to 5 the cylinder 12
65 is composed of inner and outer relatively adjustable parts. The inner part which is directly fastened to the axle 7, consists of two disks 21 and 22 carrying the folding-knife 20. The outer part of the cylinder 12
70 consists of two disks 23 and 24 which are both loosely mounted on the axle 7. A series of removable strips 25 connect said disks 23 and 24 together, and it is this outer part of the cylinder that carries the jaws 15 and 16,
75 the spindle 17 being passed through large slots 17^a in the disks 21, 22 and secured to the disks 23, 24. The two parts of the cylinder are held in their respective positions by means of clamping screws 26 projecting
80 through arcuate slots 27 in the disks 23 and 24 and entering the disks 21 and 22. By loosening the clamping screws 26, turning the two parts of the cylinder relatively to each other, removing or replacing one or
85 more strips 25 and finally again tightening the screws 26, the distance between the jaws 15, and 16 which are fastened to the outer part of the cylinder, and the folding-knife 20 that is fastened to the inner part, can be
90 varied as desired. Figs. 3 and 4 show the two extreme positions, in Fig. 3 the greatest, in Fig. 4 the smallest distance between the knife and the folding slot. As explained
95 below, this adjustment will have the effect of altering the size of the paper-bags.

That part of the cylinder 12 which carries the jaws 15, 16 carries also a gear wheel 13 which engages the gear-wheel 11 mounted
100 on the shaft 6, while the part of the cylinder 12 which carries the folding-knife 20 carries another gear-wheel of the same size as the wheel 13 (and therefore not shown) and which engages with a gear-wheel 28 fixed on the shaft 8. On the shaft 8 is moreover
105 mounted a cylinder 29 which in the same manner as the cylinder 12 is provided with a folding-slot formed by a fixed jaw 30 and a movable one 31, the latter being carried by an elbow-lever pivotally mounted on a pin
110 32 and provided with a roller 33 which, when the cylinder rotates, engages the edge

of a fixed guiding cam-disk 34. At the same height with the lowermost generatrix of the cylinder 9 and the uppermost generatrix of the cylinder 12 is arranged a series of horizontal feeding-bands 35 running between rollers mounted upon two spindles 36 on either side of the machine. These bands serve to feed the paper sheets which are brought in from the back of the machine so that they pass forward between the cylinders 9 and 12. Here they are arrested by a special apparatus not shown on the drawing and are held by a mechanism consisting of a rail 37 fixed on to the frame and a movable arm 38, which from below is pressed up against the rail 37. The arm 38 is pivoted on a pin 50 and is connected by a rod 51 with a rocking arm 53 which is fulcrumed on a pivot 52. The arm 53 carries a roller 54 which engages a cam 55, rotated with the same speed as the cylinders 9 and 12, and which has such a form that the arm 38 is automatically forced up against the rail 37 and removed again from it once for every revolution of the cylinders 9 and 12. A guard 39 is arranged below the cylinders 12 and 29. To the right of the cylinder 29 is arranged a spindle with rollers 40, and between these and the cylinder 29 are drawn chords 41 which rest in grooves on the cylinder.

The operation of the machine is as follows:—The paper-sheets are fed forward by means of the bands 35 until they attain a horizontal position between the cylinders 9 and 12. They are here held fast by being grasped between the movable rail 38 and the fixed rail 37. By the rotation of the cylinders 9 and 12 the folding-knife 10 presses the paper down between the folding jaws 15, 16 on the cylinder 12 which close upon and carry the paper along while the rails 37, 38 at the same time open. 42 in Fig. 2 shows the paper in this position. The paper is thereby folded in the middle. During the further rotation of the cylinder 12 the folding jaws 15, 16 remain closed, and the paper which is now lying double, is carried along

by the cylinder. In the position shown in Fig. 1 the movement has proceeded so far that the folding-knife 20 of the cylinder 12 presses the hindmost part of the paper between the jaws 30, 31 of the cylinder 29 which close upon the paper. The folding-jaws 15, 16 open at this moment, and the cylinder 29 pulls the paper along, whereby it is drawn back over the guard 39. The side-fold of the paper-bag is then formed. After the cylinder has made about one third of a revolution as regards the position shown in Fig. 1, the jaws 30, 31 open automatically, the chords 41 remove the paper from the cylinder 29, and the paper is carried along by means of endless bands in order to have the bottom-fold bent and gummed by means of another couple of cylinders.

I claim:

In a folding machine, the combination of a rotatable shaft, a pair of inner disks fixed to the shaft and provided with large arc-shaped slots, an obliquely disposed folding knife carried by said disks, a pair of outer disks loosely mounted on said shaft at the outer face of said inner disks respectively, and provided with arc-shaped slots, clamping screws passing through the arc-shaped slots of the outer disks and into said inner disks, a spindle passing through the arc-shaped slots of the inner disks and extending into and connecting said outer disks, elbow levers pivotally mounted on said spindle, a movable jaw carried by one end of each of said levers, a roller carried at the other end of each lever, a fixed cam-disk adapted to be engaged by said rollers, a jaw fixed to said outer disks and adapted to cooperate with the movable jaw and removable strips connecting said outer disks and lying between said knife and jaws.

In testimony, that I claim the foregoing as my invention, I have signed my name in presence of two subscribing witnesses.

BERNHARDT JOHAN JENSEN.

Witnesses:

I. HOFMAN-BANG,
ERNEST BOUTARD.