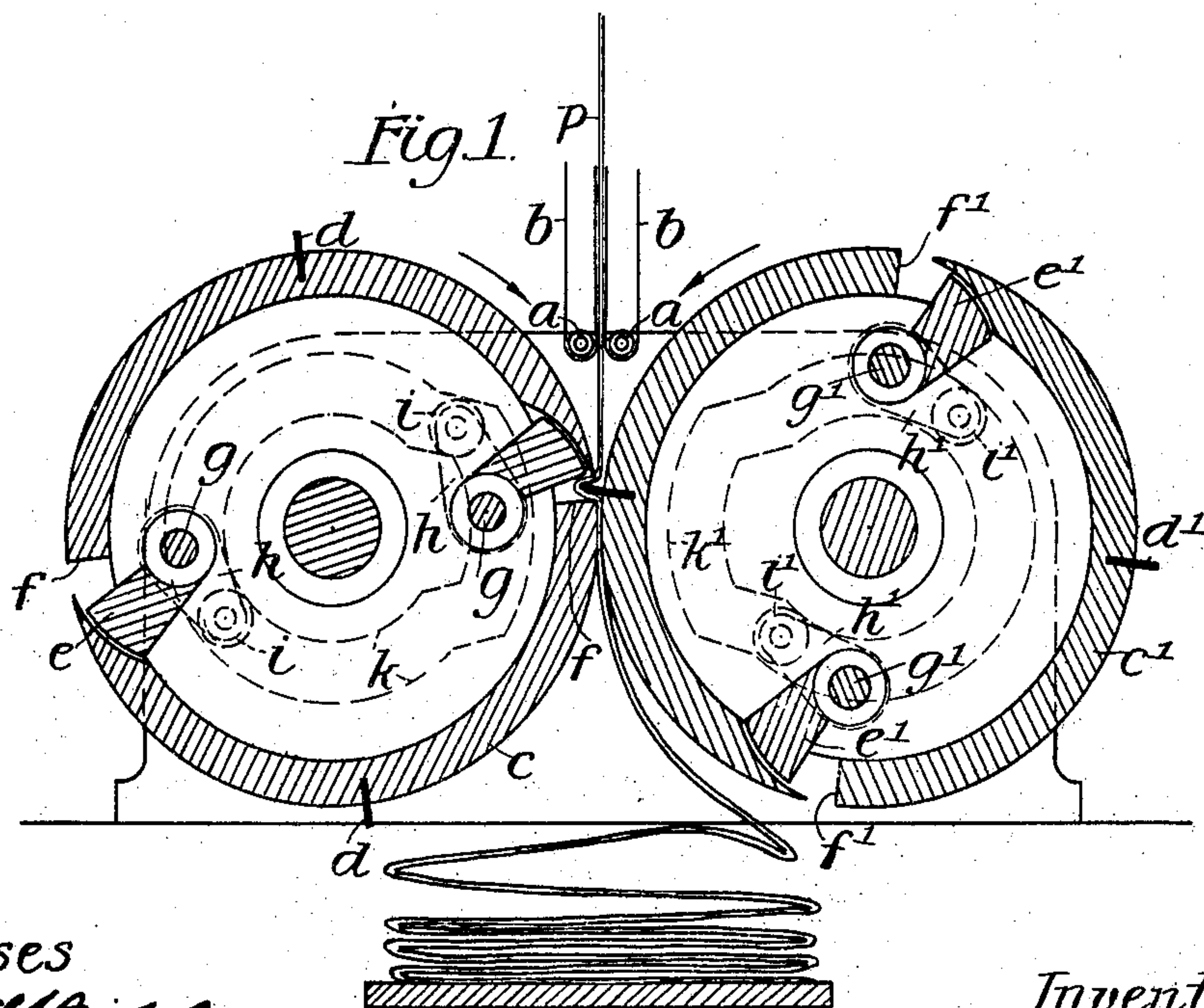
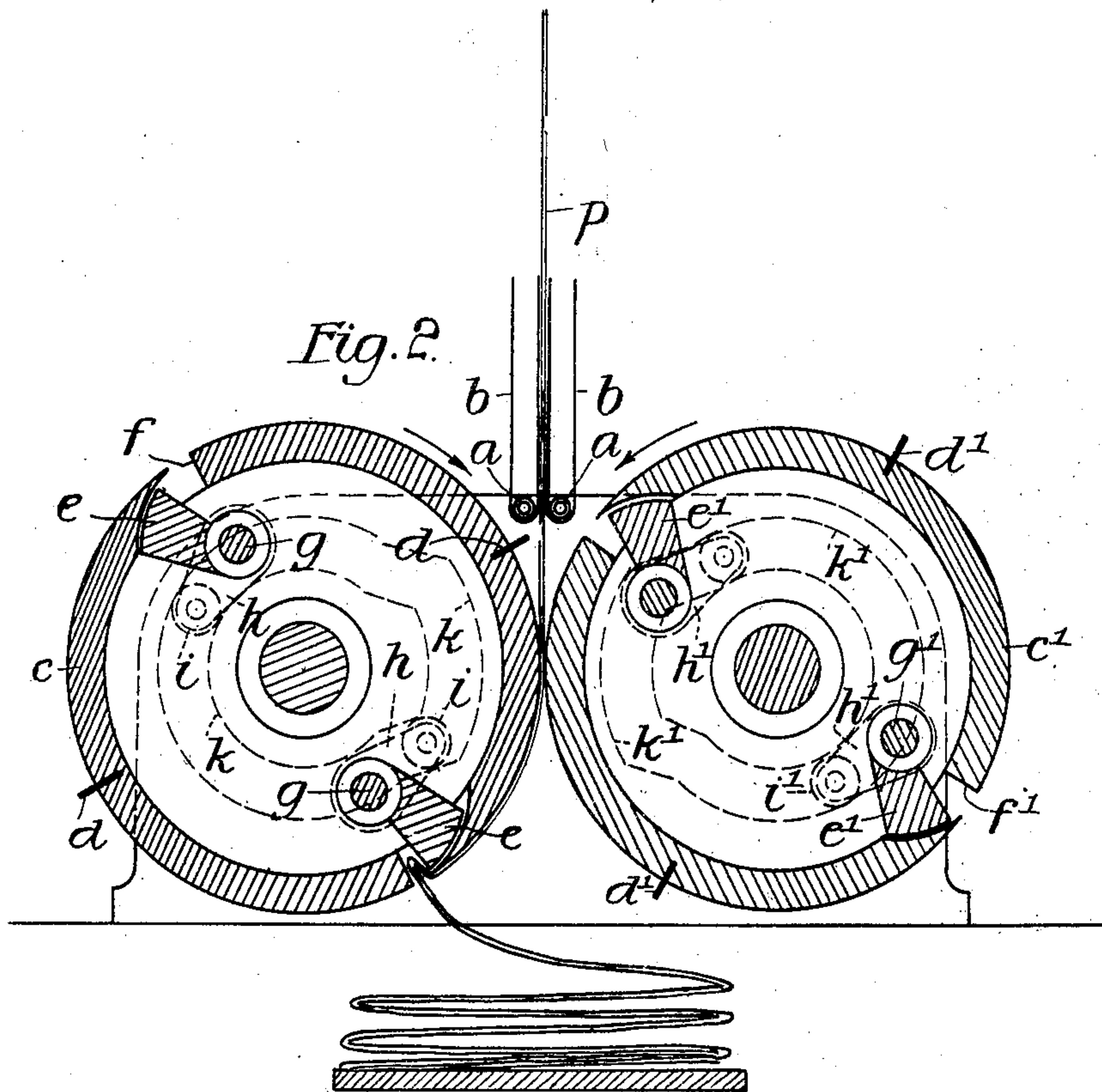


A. BARUCH.  
FOLDING MACHINE.  
APPLICATION FILED APR. 16, 1906.



Witnesses

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# UNITED STATES PATENT OFFICE.

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## FOLDING-MACHINE.

No. 896,509.

Specification of Letters Patent.

Patented Aug. 18, 1908.

Application filed April 16, 1906. Serial No. 311,955.

*To all whom it may concern:*

Be it known that I, ALPHONS BARUCH, a citizen of Hamburg, and resident of No. 19 Marschnerstrasse, Hamburg, in the Empire of Germany, have invented new and useful Improvements in Folding-Machines, of which the following is a specification.

The present invention relates to an improved paper folding machine to be employed in the production of packages of paper of which each individual sheet is folded at the center and interlocks with the two adjoining and similarly folded sheets.

Special objects of my invention are to simplify and cheapen the construction and to render more efficient serviceable and durable in operation devices of the kind referred to.

With these ends in view the invention consists in the novel combination, arrangement and adaptation of parts, all as more fully hereinafter explained, shown in the accompanying drawings and then specifically set out in the appended claims.

In the accompanying drawing Figure 1 represents a cross section through the machine. Fig. 2 represents a cross section, similar to Fig. 1, but at a different stage of the working operations.

In carrying into practice my invention I employ two cylinders  $c$  and  $c^1$ , each being fitted to act alternately as a gripping- and folding-instrument. The two cylinders  $c$  and  $c^1$  correspond in diameter and they are driven by any known means (not shown in the drawing) at uniform speed but in opposite directions as indicated by the arrows. The horizontal axles of the cylinders  $c$  and  $c^1$ , are arranged in parallelism at like elevations and at such distances apart, so as to bring the peripheral surfaces of the cylinders nearly in touch with each other.

Each cylinder carries at points diametrically opposite two tucking blades or folding knives  $d$  and  $d^1$  respectively. Intermediate between the folding knives and equidistant from the latter are provided recesses in the cylinder shells, which house the gripping members to be described in detail later on.

The two cylinders  $c$  and  $c^1$  are arranged with their folding and gripping members in opposition, that is to say a knife of one cylinder and a recess of the second cylinder correspond and co-act, when crossing the line joining the axes of said cylinders.

The gripping members consist of rotary jaws  $e$  and  $e^1$  keyed on axles  $g$  and  $g^1$  respec-

tively. These axles  $g$  and  $g^1$  are journaled in the cylinders  $c$  and  $c^1$  parallel with the rotary axis of the latter and they are fitted externally with crank arms  $h$  and  $h^1$ . Anti-friction rollers  $i$  and  $i^1$  at the free extremities of the crank arms  $h$  and  $h^1$  move in stationary cams  $k$  and  $k^1$ .

I will now proceed to describe the operation of my hereinbefore described machine:— The paper to be folded by the hereinbefore described machine is previously cut into sheets of uniform lengths, each sheet being destined to be folded at its center portion in passing the machine. According to my invention two sheets are supplied to the machine at a time, one sheet overlapping the other by half its length in the manner indicated in the drawings. Said sheets passing between endless conveyer bands  $b$  running over guide rollers  $a$ , are delivered between the cylinders  $c$  and  $c^1$ . The sheets in their length and juxtaposition are matched with the knives and gripping members of the cylinders  $c$  and  $c^1$  in such a way, that the folding knives  $d$  and  $d^1$  come to bear upon or between the ends of two sheets before getting at the center portion of the adjacent or back sheet, as clearly visible in Fig. 2, in which the center portion of the back sheet and the two ends of the front sheets are being carried with the knife blade  $d$  into the recess of the cylinder  $c^1$  so as to be folded and retained therein under the action of the rotary gripping member  $e^1$ , which presses in the direction of the abutment face  $f^1$ . On the further rotation of the cylinders  $c$  and  $c^1$  the folding knife  $d$  is retracted from the recess, the folded sheet and with same the two ends of the front sheets being still held in the recess by the pressure of the gripping member  $e^1$ . The folded paper sheets are thus carried around with the cylinder  $c^1$  and are liberated from the gripping member  $e^1$ , by the agency of the cam and rotary crank arm opening the jaw, at the proper moment for automatically stapling the folded sheets in zig-zag fashion as indicated in Figs. 1 and 2. After this folding action of the knife  $d$ , the knife  $d^1$  of the cylinder  $c^1$  performs its work and the folded sheets are carried with the cylinder  $c$  in a similar manner but in opposite direction as will be readily understood without further description.

The alternate action of the folding knives and of the gripping members matched therewith has been previously suggested in single



paper folding machines and in consequence no special claim is laid to this construction, the essence of the invention consisting in the adaptation of such a mechanism for the production of packages of folded paper, of which each sheet is folded at the center and interlocks with the two neighboring sheets, these packages of zig-zagwise interlocking centrally folded sheets serving for toilet purposes in the well known way.

While I have shown in the accompanying drawings the preferred form of my invention, it will be understood that I do not limit myself to the precise form shown, for many of the details may be changed in form or position without affecting the operativeness or utility of my invention, and I therefore reserve the right to make all such modifications as are included within the scope of the following claims, or of mechanical equivalents to the structure set forth.

What I claim as my invention and desire to secure by Letters Patent is—

1. In a folding machine of the class described, the combination with a pair of cylinders provided with appliances for folding the paper supplied in alternate directions, comprising folding blades and folding jaws co-acting therewith; of an oscillatory folding member forming part of the folding jaws, means for actuating said folding member in such a manner that the jaw is opened previous to the entrance of the folding blade and is closed on the retreat of the latter, thereby folding the sheets and simultaneously locking same reliably with the respective cylinder until the proper moment for delivery, and of means for supplying to the folding blades several sheets at a time, said sheets in their length and juxtaposition being matched with the blades in such a way, that the blades come to bear alternately in opposite directions upon and between the ends of two sheets before getting at the center portion of the adjacent or back sheet, substantially as described and shown.

2. A folding machine comprising two cylinders of equal diameters and driven at uniform speed in opposite directions, folding blades and recesses arranged alternately at the circumference of the two cylinders and

adapted to meet and engage at each revolution of the cylinders, an oscillatory folding member in each of the aforesaid recesses, cams for actuating the oscillatory folding members so as to open the recesses previous to the entrance of the folding blades and to close same on the retreat of the latter, thereby folding the sheets and simultaneously locking same reliably with the respective cylinder until the proper moment for delivery arrives, and means for supplying to the folding blades several sheets at a time, said sheets in their length and juxtaposition being matched with the blades in such a way, that the blades come to bear alternately in opposite directions upon and between the ends of two sheets before getting at the center portion of the adjacent or back sheet, substantially as described and shown.

3. A folding machine comprising two cylinders of equal diameters and driven at uniform speed in opposite directions, folding blades and recesses arranged alternately at the circumference of the two cylinders and adapted to meet and engage at each revolution of the cylinders, an oscillatory folding member in each of the aforesaid recesses, a cam-operated crank arm on the axle of each oscillatory folding member for actuating the oscillatory folding members so as to open the recesses previous to the entrance of the folding blades and to close same on the retreat of the latter, thereby folding the sheets and simultaneously locking same reliably with the respective cylinder until the proper moment for delivery and means for supplying to the folding blades several sheets at a time, said sheets in their length and juxtaposition being matched with the blades in such a way, that the blades come to bear alternately in opposite directions upon and between the ends of two sheets before getting at the center portion of the adjacent or back sheet, substantially as described and shown.

In witness whereof I have hereunto signed my name this 3rd day of April 1906, in the presence of two subscribing witnesses.

ALPHONS BARUCH.

Witnesses:

OTTO W. HELLMRICH,  
IDA C. HAFFERMANN.