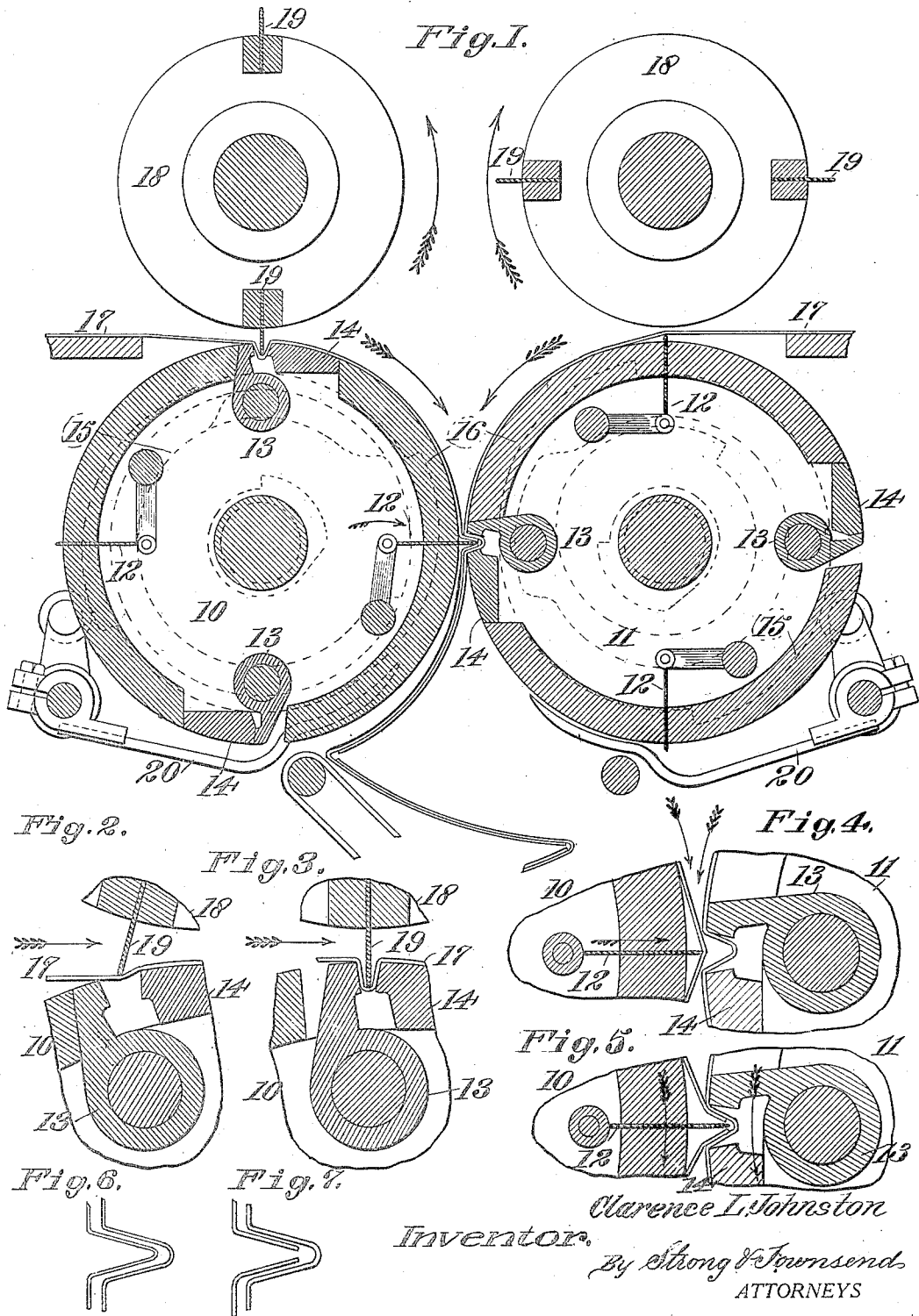


C. L. JOHNSTON.
INTERFOLDING MACHINE.
APPLICATION FILED SEPT. 10, 1919.

1,346,602.

Patented July 13, 1920.



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INTERFOLDING-MACHINE.

1,346,602.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, CLARENCE L. JOHNSTON, a citizen of the United States, residing at Oakland, in the county of Alameda and State of California, have invented new and useful Improvements in Interfolding-Machines, of which the following is a specification.

This invention relates to cutting and interfolding two webs of paper to form packages consisting of a series of sheets wherein the severed ends of two adjacent sheets cut from one web lie within a central fold of a sheet cut from the other web. Machines of this class usually embody a pair of rolls having cooperating severing and folding devices. The prior art machines for this purpose usually cut the incoming webs at one point in the travel of the rolls and do the folding at another point. This makes it necessary to provide means for controlling the severed ends of the sheets while passing from incoming to folding position. Such means include a row of pins to puncture the sheets or suction means to retain the sheets in place on the rolls. It has also been proposed to only partially sever the incoming webs in the first instance, leaving enough stock intact to insure that the webs shall be carried around the roller. Then when the folding takes place the severing of the partially cut web is completed. This is done by an interrupted knife which pierces only at the points where the web is uncut. As an incident to the operation of this knife it penetrates also the other web and thus in the finished product each sheet will be found to contain perforations along the line of its fold. This, of course, is highly objectionable in paper sheets intended for toilet use.

In the present invention, while I entirely cut the sheet at the time of folding, and thus am enabled to do away with means for controlling the loose ends, I first tuck the incoming web in the gripper or folding jaws to such a depth that when the other web is inserted therein and severed the severing device will not extend to the bottom of the tuck. In other words, each incoming web is given a preliminary tuck in the folding jaws at alternate points along the length of the webs, and, thereafter a knife comes into cooperation with the folding jaw to insert the remaining web and simultaneously sever, the depth of penetration of the knife being

less than the depth of the tuck in the outside sheet. Thus there is no danger of puncturing the sheet along the line of its fold.

In the accompanying drawings:

Figure 1 shows a vertical, sectional view 60 of a machine embodying my invention.

Figs. 2 and 3 show detail sectional views illustrating different positions of the tucker blade and folding jaws.

Figs. 4 and 5 show detail sectional views 65 illustrating different positions of the cooperating severing device and folding jaws.

Figs. 6 and 7 are diagrams of interfolding webs before and after the inside web is cut.

The machine herein shown comprises preferably cooperating cylinders 10 and 11, each provided preferably with two reciprocating knives 12 placed at diametrically opposite points on the cylinder and two sets of gripper or folding jaws, each of the latter 75 consisting of one movable jaw 13 and one stationary member 14. These jaws are placed also at diametrically opposite points and at 90° from the knives. A knife on one cylinder cooperates with a pair of jaws on 80 the other cylinder. A cam mechanism 15 controls the operation of the movable jaws and a cam mechanism 16 controls the operation of the knives or severing devices.

A web of paper 17 is fed in at each side of 85 the machine, and, overlying each cylinder is a cooperating roll 18 carrying a pair of tucker blades 19 to cooperate with the folding jaws on the cylinder. The web of paper first passes between the cylinder and roll 90 and the function of the tucker blades is to form a tuck in the web, as shown in Figs. 2 and 3. The cam mechanism at this point causes the movable jaw to open while the tucker blade forms the tuck, and thereafter the 95 movable jaw closes to retain the tuck until such time as the folding jaws come into cooperation with the severing devices on the adjacent cylinder. In this position, as illustrated by Figs. 4 and 5, the movable jaw 100 opens to allow the severing device to be projected between the two jaws. The cam mechanism which controls the severing device produces the necessary outward movement of the knife so that the web of paper 105 adjacent the knife will be inserted between the folding jaws, and, this web being under tension, will be completely severed upon the outward movement of the knife. The limited movement of the knife is such that it will 110

not come into contact with the web of paper on the other cylinder, and thus there is no danger of the sheet being punctured at the line of its fold. After the inside web is cut and inserted into the bight formed on the other web the movable jaw closes and carries the folded and interleaved sheets to a point near the bottom of the cylinder where stripper fingers 20 serve to remove the sheets from the cylinder.

From the foregoing it will be seen that the mechanism necessary to produce folded and interleaved sheets of this character has been greatly simplified by reason of my improved method of folding and cutting the sheets. The usual control means has been eliminated and a better result is produced in that the sheets are not punctured at any point.

Various changes in the construction and arrangement of the several parts herein shown may be resorted to without departing from the spirit of my invention as disclosed in the appended claims.

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

1. In an apparatus of the character described, means for folding a pair of webs of paper and means for completely severing one of said webs at the time of folding without puncturing the other web.

2. In an apparatus of the character described, means for folding a pair of webs of paper and means for completely severing one of said webs at the time of folding without puncturing the other web, said means acting alternately so that first one web is severed and then the other.

3. A method of interfolding paper which consists in alternately folding one web within the other and simultaneously severing the inside web.

4. A method of interfolding two webs of paper which consists in forming a tuck in each web at alternate points and folding the remainder into said tuck and simultaneously severing it.

5. An apparatus of the character described comprising means for feeding a pair of webs of paper, means for forming a tuck in each web at alternate points and means for inserting the other web into the tuck and simultaneously severing it.

6. In an apparatus of the character described, a pair of cooperating cylinders between which are fed two webs of paper, a set of folding jaws on each cylinder, means to cooperate with each set of folding jaws to form a tuck in each web at alternate points and a severing device carried by each cylinder to cooperate with the folding jaws on the other cylinder and acting to insert a web into the tuck on the other web and simultaneously sever it.

7. In an apparatus of the character described, a pair of cooperating cylinders between which a pair of webs of paper are fed, a set of folding jaws on each cylinder, a roller cooperating with each cylinder and provided with a tucker blade which serves to form a tuck in each web at alternate points and severing devices carried by each cylinder, the severing device on one cylinder cooperating with the folding jaws on the other and operative to insert a web of paper into the tuck formed in the other web to simultaneously sever the web which is inserted.

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

CLARENCE LORAN JOHNSTON.

Witnesses:

EDMUND JOS. FARINA,
C. E. FRISBIE.