F. GIROUD

MACHINE FOR CUTTING PAPER BOX BLANKS.

APPLICATION FILED MAR. 31, 1908.

924,607.

Patented June 8, 1909.

2 SHEETS—SHEET 1.

FIG. 1.

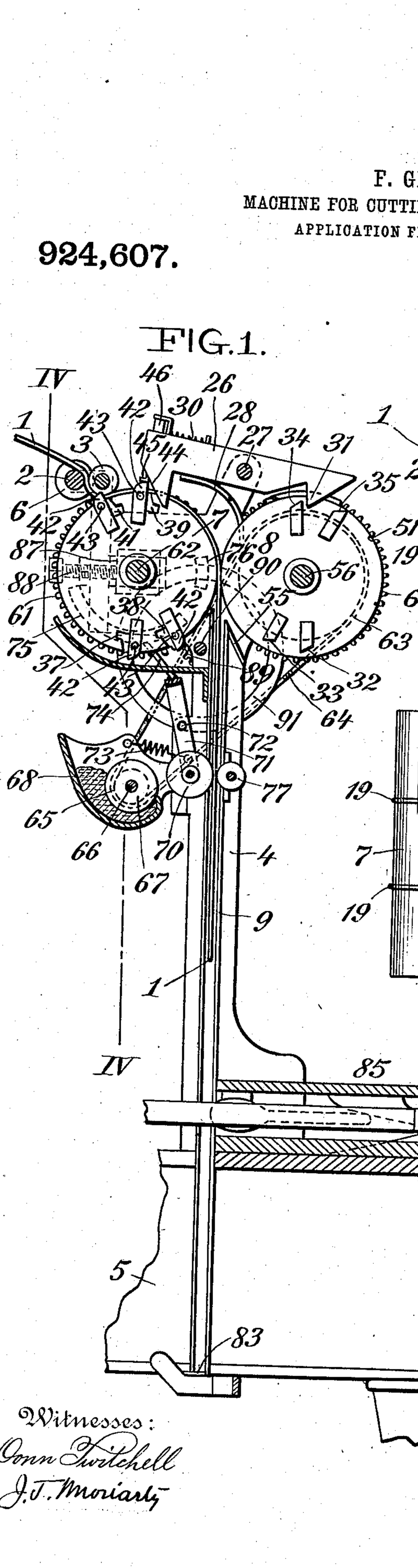


FIG. 2.

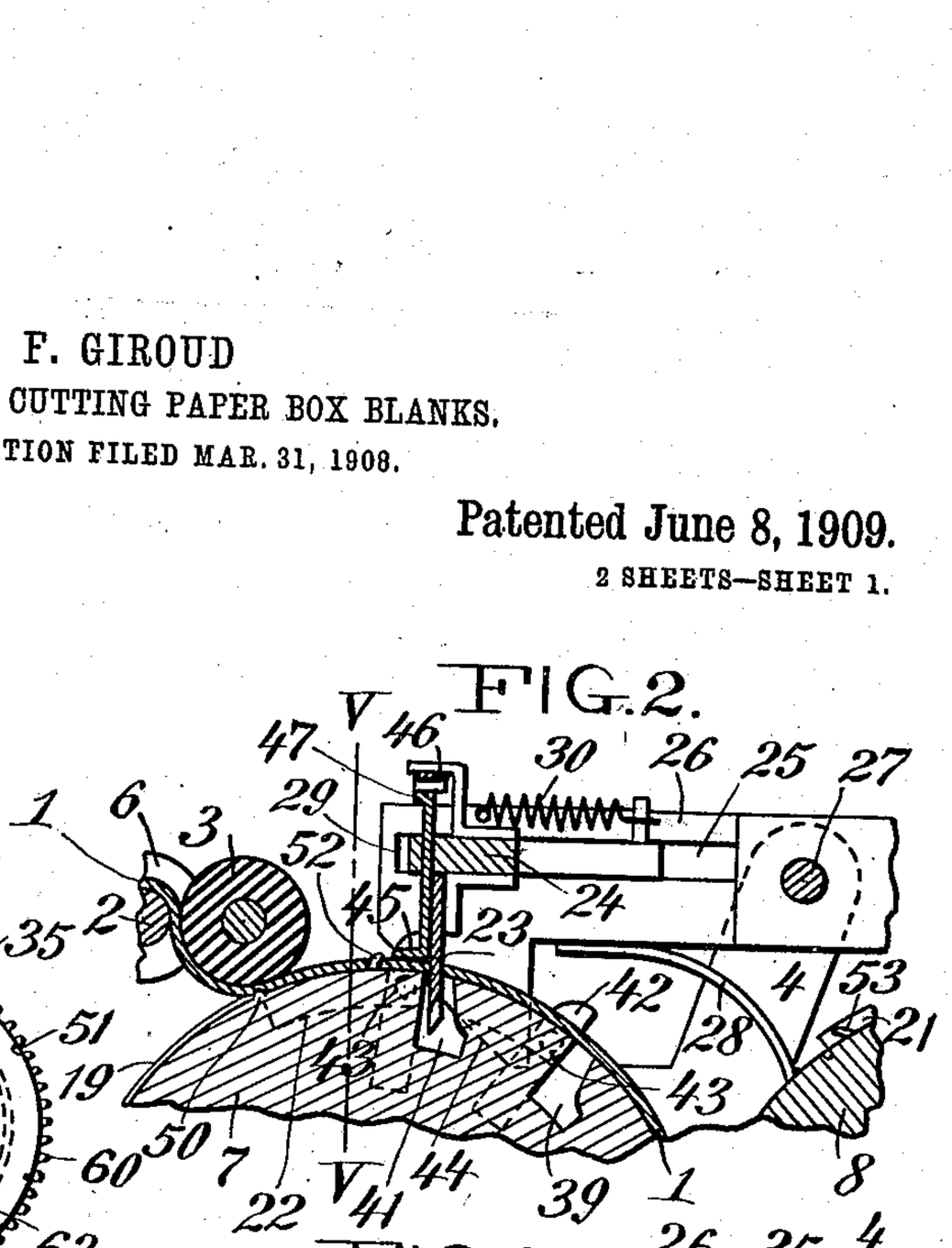
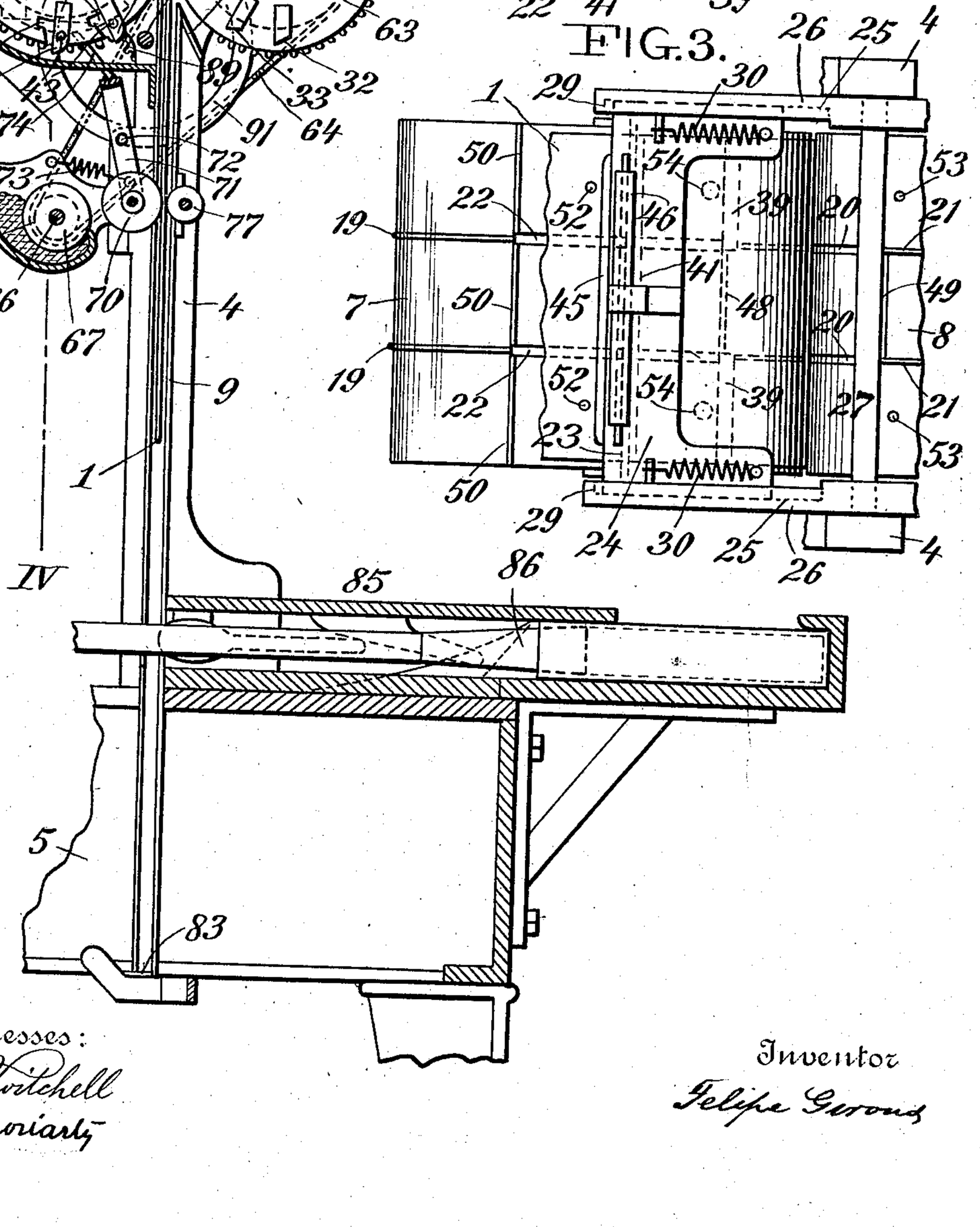


FIG. 3.



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2 SHEETS—SHEET 2.

FIG. 5.

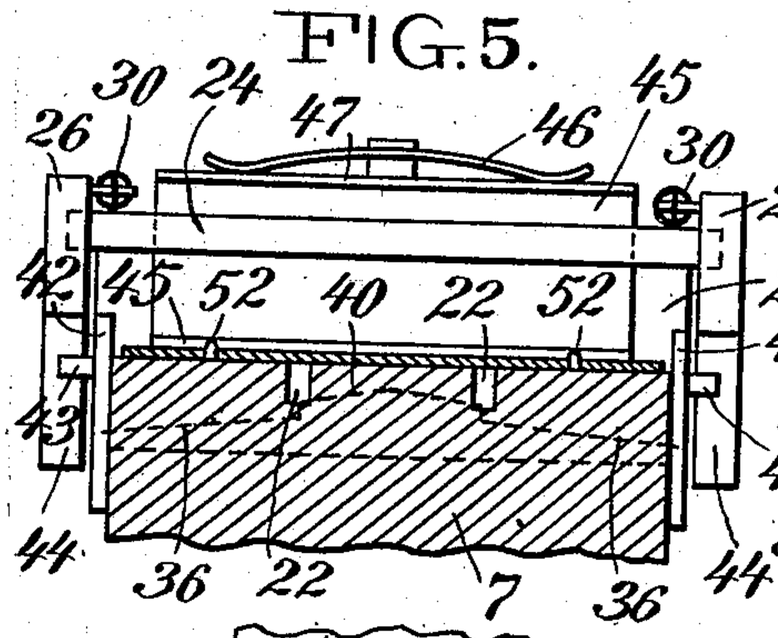

FIG. 4.

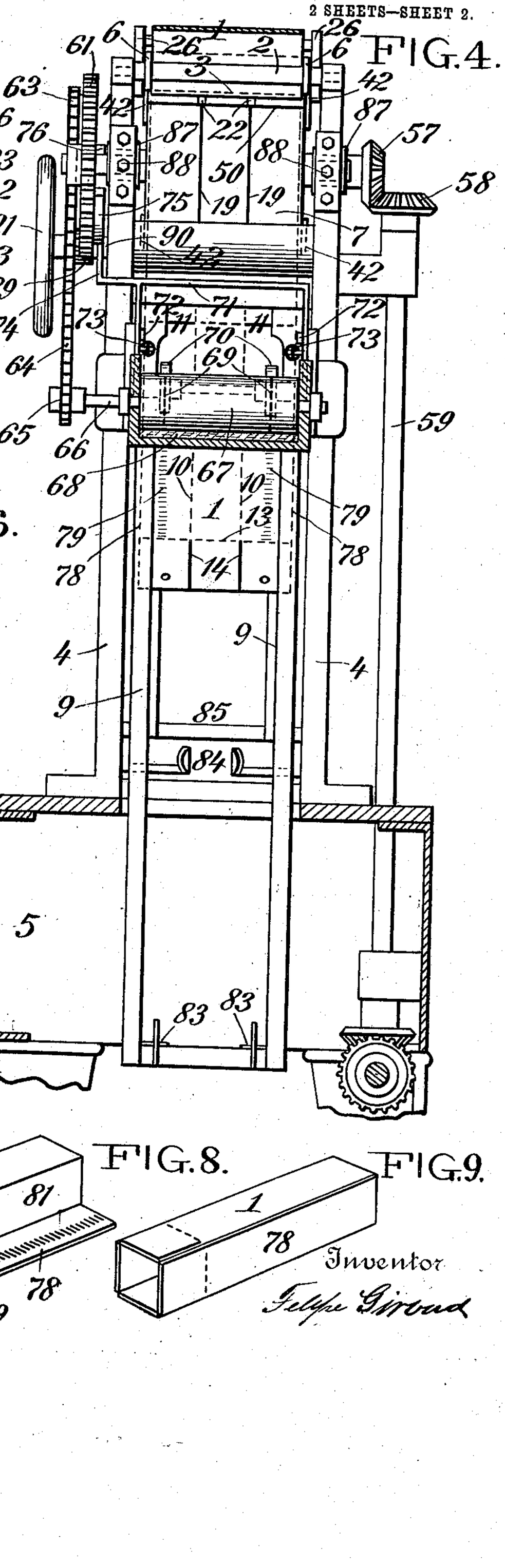

FIG. 6.

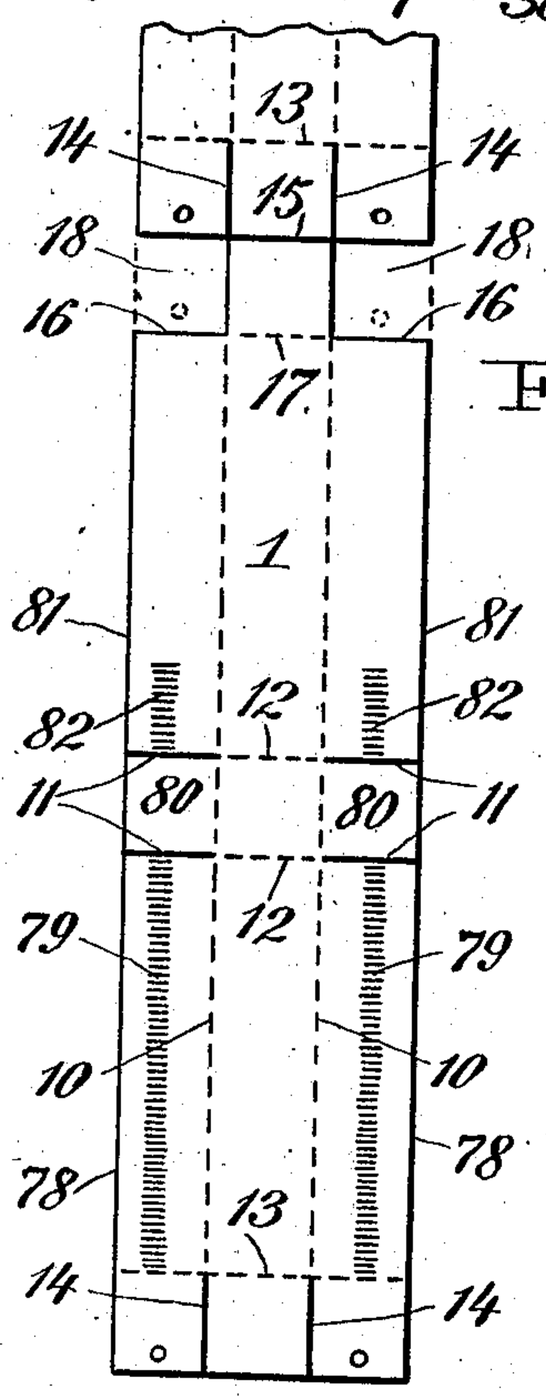

FIG. 7.

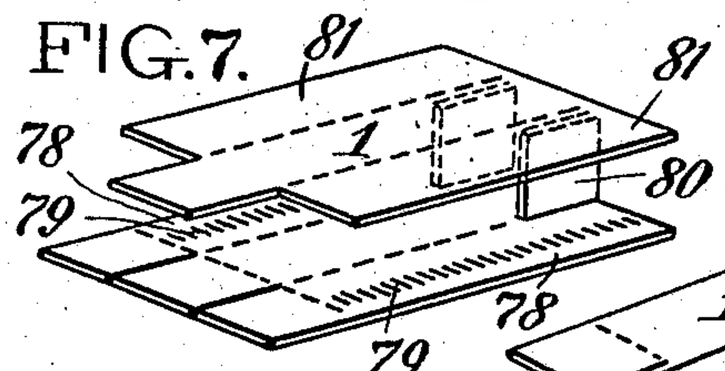

FIG. 8.

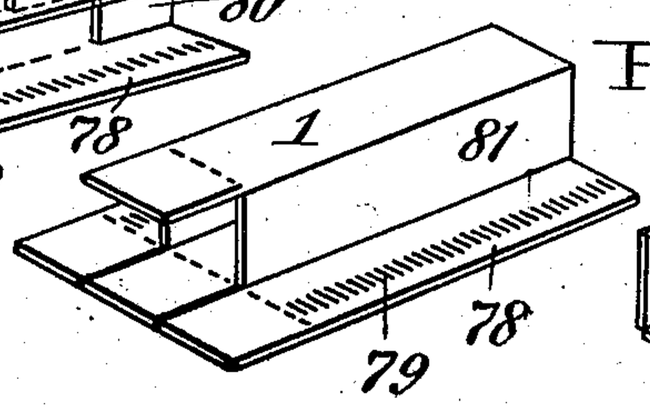

FIG. 9.

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MACHINE FOR CUTTING PAPER-BOX BLANKS.

No. 924,607. Specification of Letters Patent. Patented June 8, 1909.

Original application filed October 12, 1907, Serial No. 397,139. Divided and this application filed March 31, 1908. Serial No. 424,368.

To all whom it may concern:

Be it known that I, FELIPE GIROUD, a citizen of the Island of Cuba, and a resident of the city of New York, in the county of New York and State of New York, have invented a certain new and useful Machine for Cutting Paper-Box Blanks, of which the following is a specification.

This application for a patent is a division of my former application; filed the twelfth day of October 1907, Serial Number 397139 and entitled machines for wrapping various articles.

This invention relates to machines for cutting paper blanks for use in the formation of paper boxes.

The invention consists of mechanism for forming and cutting off the blanks from a supply strip of paper, said paper having a uniform width.

Other details are shown in the accompanying drawings, in which:

Figure 1 is a sectional elevation of the machine. Fig. 2 is an enlarged sectional view of the cutting mechanism. Fig. 3 is a plan view of some of the parts shown in Fig. 2. Fig. 4 is a section on the line IV—IV of Fig. 1. Fig. 5 is a section on the line V—V of Fig. 2. Fig. 6 is a view illustrating the formation of the blanks. Figs. 7, 8 and 9 show successional steps in folding one of the blanks.

A continuous supply of paper 1 passes between two quick rollers 2 and 3, which rotate in bearings formed on standards 4 forming part of the main frame 5. As the paper passes between the rollers 2 and 3, it is guided by flanges 6 formed on roller 2, into alinement with a drum 7. Drum 7 and another drum 8 actuates means for making slits and creases in the paper forming the blank, finally cutting off the blank and feeding it to a chute 9 as hereinafter described.

As shown in Fig. 6 a crease 10 is formed lengthwise of the blank, a distance from each margin determined by the shape of the box to be formed. At the center of the blank, two slits 11 are cut, extending from each margin to crease line 10 at a distance apart equal to their length and creases 12 are formed across the center part on a line with slits 11. At the lower end of the blank, a crease 13 is formed crosswise, a distance from the end equal to the distance of creases 10 from the side margins, and two slits 14 are cut extending from the end to crease 13 on a line with crease 10. The upper end of the blank is separated from the blank coming after, by a crosscut 15 extending the full width of the paper. A slit 16 is cut extending from each margin to crease 10, at a distance from the upper end equal to its length, a crease 17 being formed across the center part on a line with slits 16. A continuation of slits 14 of the second mentioned blank is made at the upper end of the first mentioned blank extending from crosscut 15 to slit 16. This causes the portion 18 included within the dotted margin to be cut away. As the paper passes between drums 7 and 8, lengthwise creases 10 are formed by ribs 19 on drum 7, which force the paper into corresponding depressions 20 on drum 8, the lengthwise slits 14 being cut by knives 21 on drum 8, said knives passing through the paper into corresponding depressions 22 on drum 7. The cross slits 11, 15 and 16 are cut by means of a knife 23 attached to a yielding slide 24 moving in guides 25 on a frame 26 centrally pivoted at 27 to standards 4. The end of frame 26 carrying slide 24 is held up by means of springs 28, and slide 24 is held against a flange 29, at the outer end of frame 26, by means of springs 30. The end of frame 26 opposite slide 24 is provided with projections 31 adapted for engagement with cams 32, 33, 34 and 35 formed on the ends of drum 8. Cams 32, 33 and 34 cause the ends 36 of knife 23 to cut slits 11 and 16 by passing through the paper into corresponding recesses 37, 38 and 39 formed on drum 7. Cam 35 causes a greater downward movement of knife 23, which causes the center 40 of the knife, along with the ends 36, to pass through the paper into a recess 41 extending across the whole face of drum 7, thereby making crosscut 15, the full width of the paper. Knife 23 is guided into recesses 37, 38, 39 and 41 by means of projections 42 formed on the ends of drum 7. When knife 23 comes in contact with guides 42, springs 30 will permit slide 24 carrying knife 23, to move in unison with drum 7, until pins 43 riding against an inclined face 44 formed on frame 26, causes the frame to move the knife out of engagement with the paper and guides 42. When knife 23 passes down through the paper, a stripper 45 on slide 24 is moved up in opposition to the force of a spring 46, so that when the knife is lifted from the paper, the stripper will hold

the paper down during the withdrawal of the knife, the stripper being lifted from the paper after the withdrawal of the knife, by means of slide 24, which takes against a flange 47 formed on the upper end of the stripper.

The cross creases 12 and 17 are formed as the paper passes between the drums 7 and 8 by means of short ribs 48 on roller 7 placed between the recesses 37, 38 and 39, which the ends 36 of knife 23 enter in cutting the cross slits 11 and 16. Ribs 48 force the paper into corresponding depressions 49 formed on roller 8. This crease 13 is formed by means of a rib 50 extending across the full width of the drum 7, said rib forcing the paper into a corresponding depression 51 formed on drum 8.

Pins 52 on drum 7 pierce the forward end of the paper, so that after the knife 23 has cut off the paper blank the pins 52 will hold the paper against drum 7, thereby guiding the paper between the drums 7 and 8, and when the forward end of the paper has passed between the drums, the upper end of the chute will draw the paper away from the pins 52.

In order that the cut away portion 18 of the paper shall not enter chute 9, pins 53 on drum 8 pass through the portion 18 into corresponding holes 54 formed on drum 7, so that as the portion 18 passes from between the drums 7 and 8, the pins 53 aided by knives 21 will carry portions 18 away from alinement with chute 9, and permit it to slide off upon the incline 55.

To drum 8 is secured a shaft 56 which rotates in bearings on standards 4 and has a bevel gear 57 on one end in mesh with a bevel gear wheel 58 on a vertical shaft 59 by which it is driven. The opposite end of shaft 56 has a gear wheel 60 attached, in mesh with a gear wheel 61 on a shaft 62 secured to drum 7. Attached to gear wheel 60 is a chain wheel 63 which drives a chain 64 and a chain wheel 65. Chain wheel 65 is secured to a shaft 66 carrying a roller 67 which turns in a paste reservoir 68. A series of indentations 69 are made in paste roller 67 near each end, which serve to carry paste from reservoir 68, to be taken up by paste wheels 70. The paste wheels 70 are mounted at the lower end of a swinging frame 71 pivoted at 72. Paste wheels 70 are held against paste roller 67 by means of springs 73 acting on the lower end of swinging frame 71. The upper end of swinging frame 71 is provided with an extension 74 adapted for engagement with cams 75 and 76 on gear wheel 61. By means of cams 75 and 76, paste wheels 70 are moved away from paste roller 67, into engagement with side flaps of the blank as they pass down chute 9. Wheels 77 are so placed on the opposite side of the blank that the blank passes between paste wheels 70 and said wheels 77. Cam 75 causes paste wheel 70 to be held in contact with side flaps 78 during their travel between wheels 70 and 77, causing paste to be applied throughout the length of side flaps 78, as shown at 79 in Fig. 6. A break occurs before cam 76 acts, causing paste wheel 70 to be moved away from the center end flap 80. Then as the flaps continue in their downward movement, cam 76 will cause paste wheel 70 to apply paste upon side flaps 81 for a distance equal to the width of the center end flap 80, as shown at 82 in Fig. 6.

The blank as it passes from between drums 7 and 8 comes to rest on supports 83 at the lower end of chute 9. The center of the blank then stands on a line with a channel 84 forming part of a folding device 85. A reciprocating plunger 86 forces the blank through the folding device, causing the center end flaps 80 to be folded as shown in Fig. 7, the upper wide flaps 81 to be folded as shown in Fig. 8, and the lower side flap 78 to be folded as shown in Fig. 9. The paste applied to the side flaps causes the folded flaps to adhere to each other.

By means of bevel gear wheels 57 and 58, vertical shaft 59 causes the rotation of shaft 56, and by means of gear wheels 60 and 61, shaft 56 causes the rotation of shafts 62. The bearings 87 of shaft 62 can be adjusted by means of screws 88, so that drum 7 can be adjusted to suit the thickness of paper passing between drums 7 and 8. In mesh with gear wheel 61 is a pinion 89 secured to a shaft 90, to which is secured a fly wheel 91, the purpose of which is to ease the shock caused by knife 23 when it strikes guides 42 and drum 7.

Having described my invention, I claim—

1. A paper cutting machine comprising, two drums between which the paper passes, a knife on one of said drums cutting lengthwise slits in said paper, and means actuating a knife cutting cross slits in said paper, said last mentioned knife cutting off paper in which said lengthwise and cross slits have been cut.

2. In a paper cutting machine the combination with a revolving drum having recesses over which the paper passes, of a knife attached to a yielding slide moving in a swinging frame, and means guiding said knife through the paper into and from said recesses, whereby the knife moves in unison with the drum, while the knife passes through and is withdrawn from the paper.

3. A paper cutting machine comprising a revolving drum over which the paper passes, a swinging frame carrying a yielding slide having a spring pressed stripper, and an attached knife, recesses and guides on said drum, and means actuating said swinging frame, said knife engaging said guides and passing through the paper into said recesses,

said yielding slide permitting the knife to move in unison with the drum while the knife remains in the paper; and means causing said swinging frame to withdraw the knife from the paper, said stripper holding the paper against the drum while the knife is being withdrawn.

4. A paper cutting machine comprising two drums between which the paper passes, a knife on one of said drums cutting lengthwise slits in said paper, a swinging frame carrying a yielding slide having a knife attached, guides on one of said drums, means actuating said swinging frame causing said knife engaging said guides to pass through and be withdrawn from the paper, said yielding slide permitting the knife to move in unison with the drum while the knife remains in the paper.

5. A paper cutting machine comprising two drums between which the paper passes, a knife on one of said drums cutting lengthwise slits in said paper, a swinging frame carrying a yielding slide having a spring pressed stripper and an attached knife, recesses and guides on one of said drums, means actuating said swinging frame causing said knife engaging said guides to pass through the paper into said recesses, and be withdrawn from said recesses and paper, said yielding slide permitting the knife to move in unison with the drum while the knife remains in the paper, and said stripper holding the paper against the drum while the knife is being withdrawn from the paper.

6. A paper cutting machine comprising two drums between which the paper passes, a knife on one of said drums cutting lengthwise slits in said paper, a pivoted frame carrying a yielding slide having a knife attached, recesses and guides on one of said drums, over which recesses the paper passes, the other drum having cams actuating said swinging frame, said knife engaging said guides and passing through the paper into said recesses, said yielding slide permitting the knife to move in unison with the drum having the guides, while the knife remains in the paper; and means on the last mentioned drum causing said pivoted frame to withdraw the knife from said recesses and paper.

7. A paper cutting machine comprising two drums between which the paper passes, a pivoted frame carrying a yielding slide having a knife attached, recesses and guides on one of said drums, over which recesses the paper passes, the other drum having cams actuating said swinging frame, said knife engaging said guides and passing through the paper into said recesses, said yielding slide permitting the knife to move in unison with the drum having the guides, while the knife remains in the paper; and means on the last mentioned drum, causing said pivoted frame to withdraw the knife from said recesses and paper.

8. A paper cutting machine comprising two drums between which the paper passes, a knife on one of said drums cutting lengthwise slits in said paper, a pivoted frame carrying a yielding slide having an attached knife for cutting across the paper, the ends of said knife cutting deeper than the middle, said knife engaging said guides and passing through the paper into said recesses, the other drum having cams which actuate said swinging frame causing the ends of said knife to move a short distance into the paper for cutting short cross slits, the last mentioned drum having other cams actuating the swinging frame, and causing said knife to move a greater distance for cutting off the blank.

9. A paper cutting machine comprising, two drums between which the paper passes, knives on one of said drums cutting lengthwise slits in said paper, means actuating a knife cutting cross slits in said paper, said last mentioned knife cutting off a blank in which said slits have been cut, a chute receiving said blank as it passes from between said drums, and pins on one of said drums serving to guide said paper between said drums, said chute serving to withdraw said blank from the pins, and guide it into said chute.

10. A paper cutting machine comprising two drums between which the paper passes, knives cutting lengthwise and cross slits in said paper, and causing the formation of a cut out portion, one of said knives cutting off paper, a blank in which said slits have been cut, a chute receiving said blank as it passes from between said drums; and pins on one of said drums serving to withdraw said cut out portion away from said chute.

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