W. H. WALDRON.

BORDER CUTTING MACHINE.

APPLICATION FILED JULY 14, 1914.

1,136,741.

Patented Apr. 20, 1915.

4 SHEETS—SHEET 1.

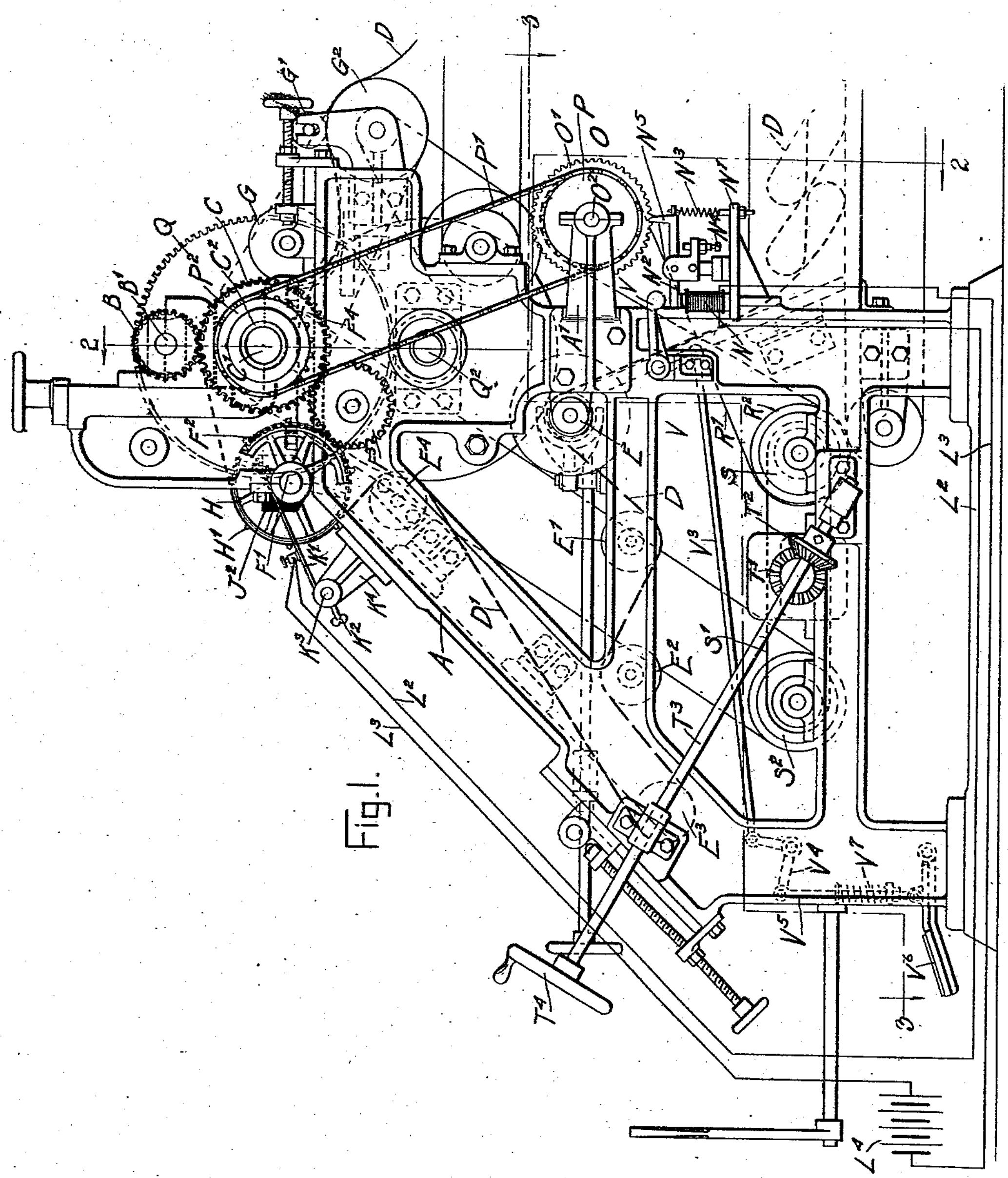

Fig. 1.

WITNESSES

C. K. Reichenbach

Fred. J. Hoster

INVENTOR

William H. Waldron

BY Munn & Co

ATTORNEYS

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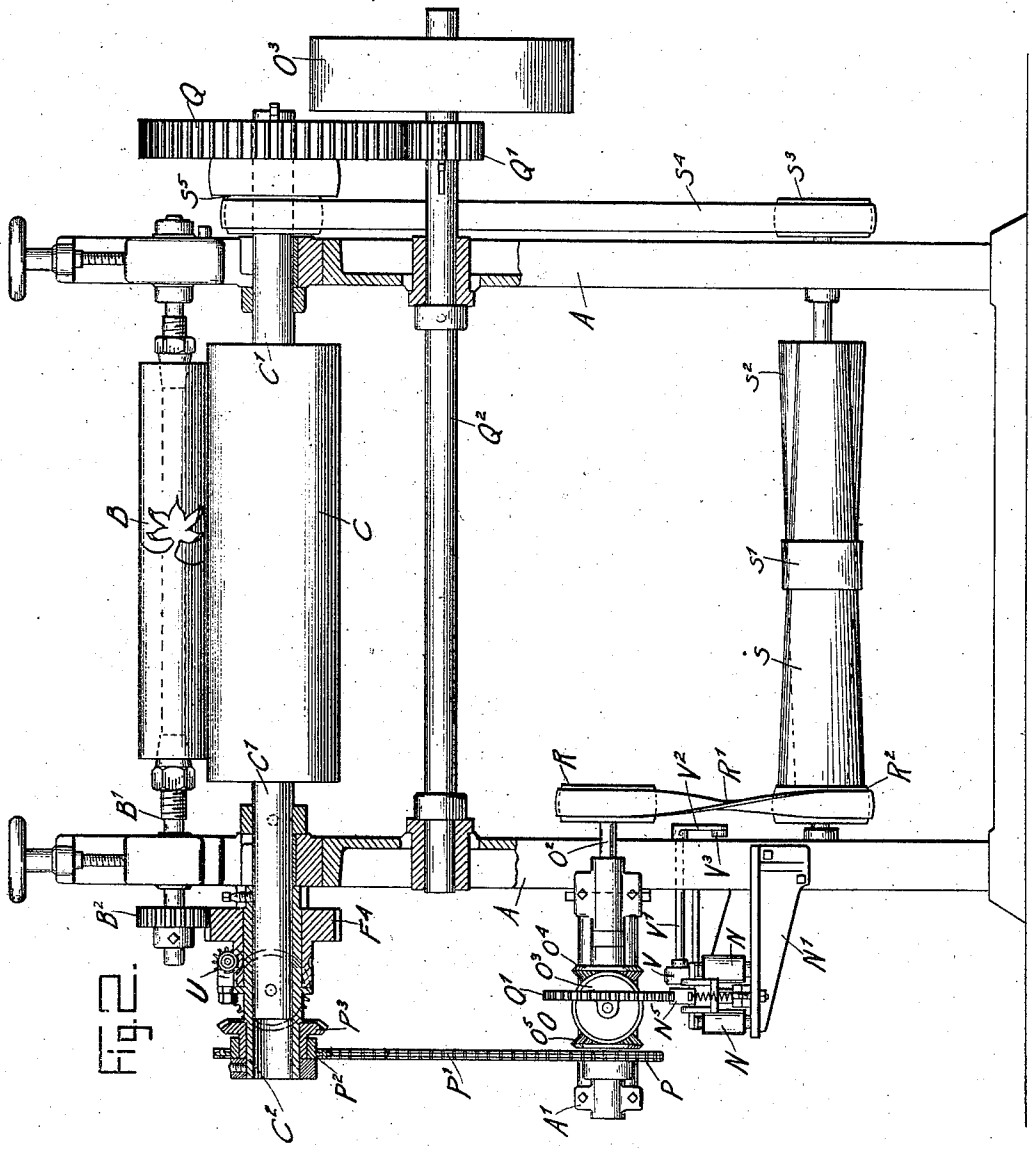

Fig. 2.

WITNESSES

E. K. Reichenbach.

Rud. Hostitz

INVENTOR

William H. Waldron

BY Munn & Co

ATTORNEYS

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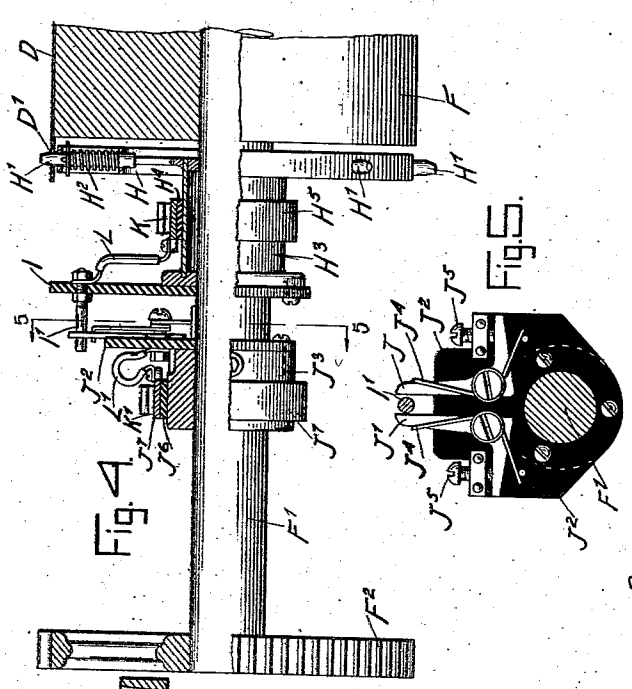

Fig. 4.

Fig. 5.

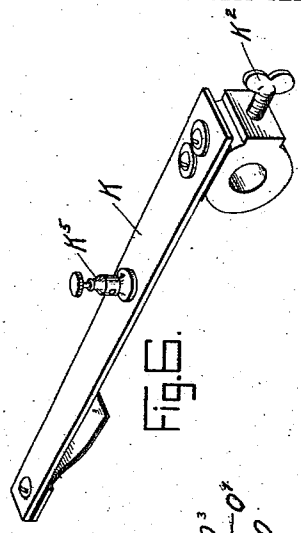

Fig. 6.

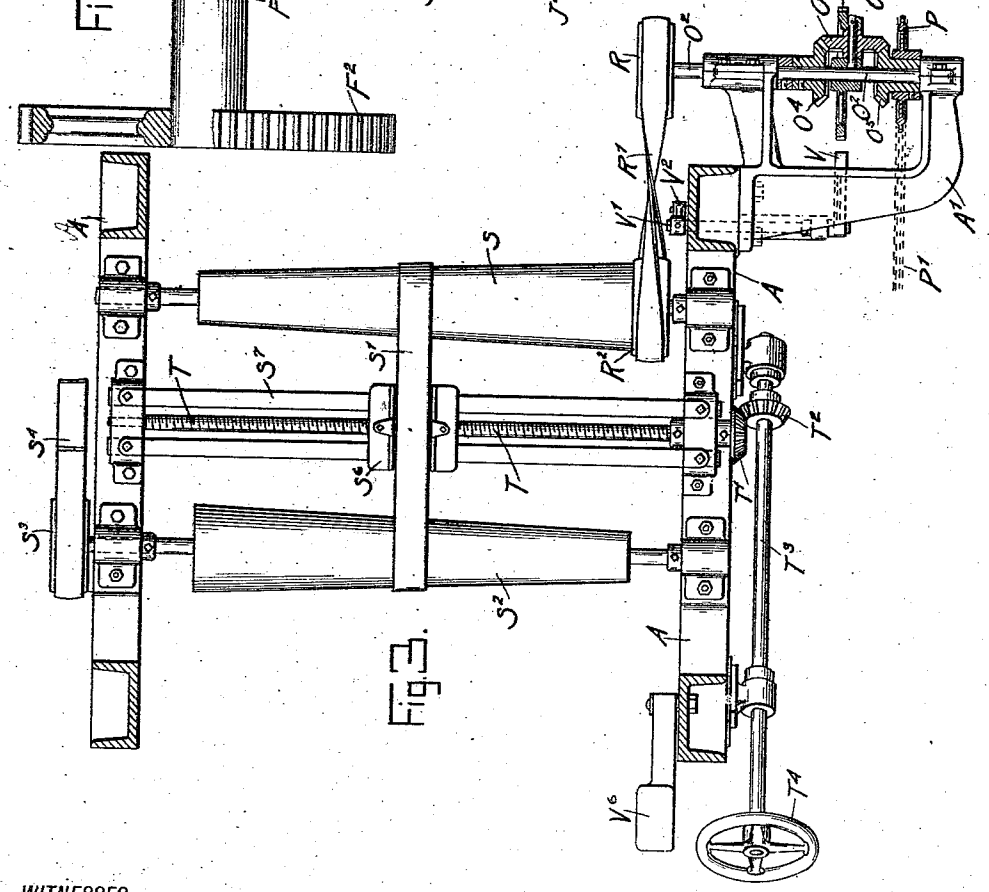

Fig. 3.

WITNESSES

E. K. Reichenbach.

Rev. J. Hoskins.

INVENTOR

William H. Waldron

BY Munn & Co

ATTORNEYS

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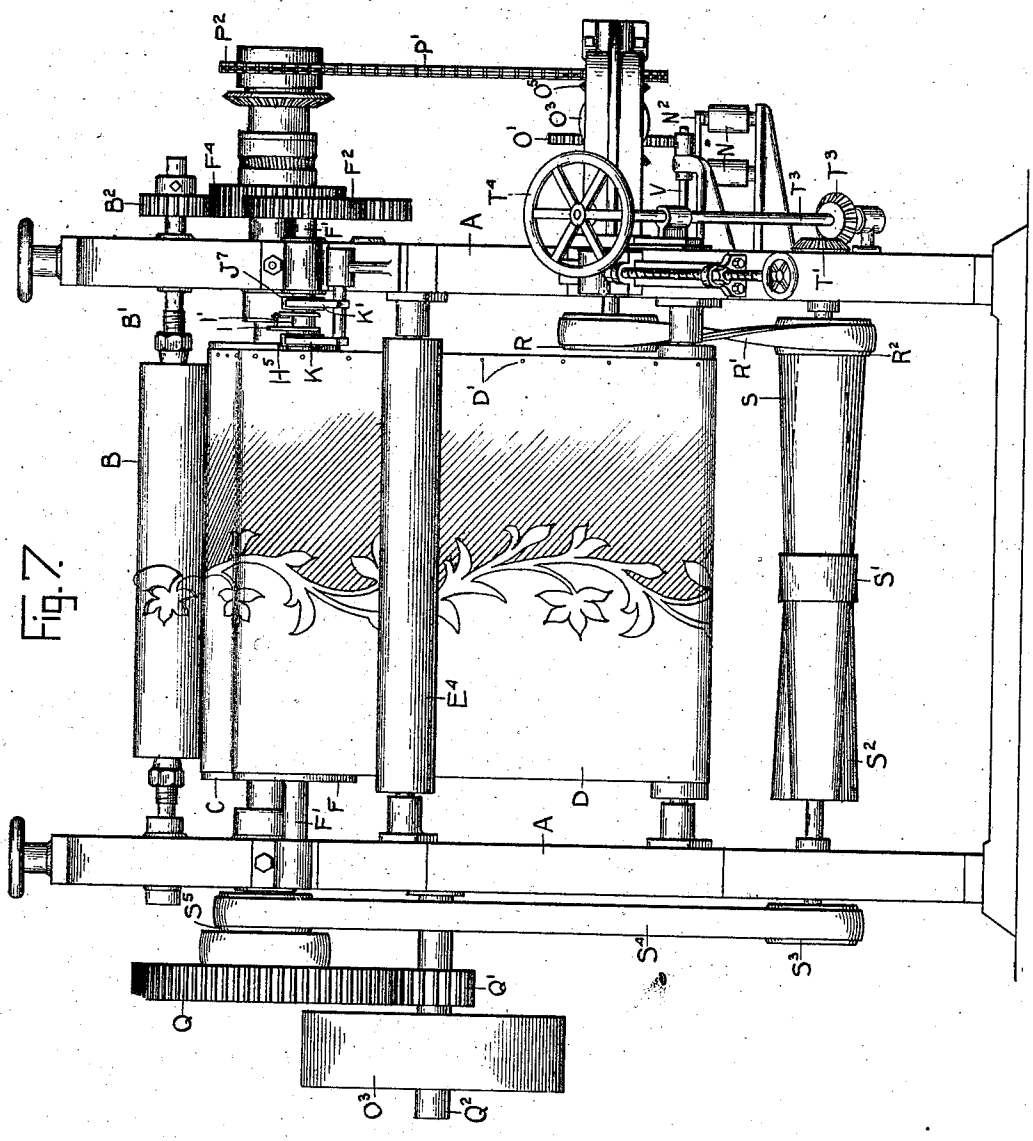

Fig. 7.

WITNESSES

E. K. Reichenbach.

Rud. J. Koster.

INVENTOR

William H. Waldron

BY Munn & Co

ATTORNEYS

UNITED STATES PATENT OFFICE.

WILLIAM HUBELI WALDRON, OF HIGHLAND PARK, NEW JERSEY, ASSIGNOR TO JOHN WALDRON CO., OF NEW BRUNSWICK, NEW JERSEY.

BORDER-CUTTING MACHINE.

1,136,741. Specification of Letters Patent. Patented Apr. 20, 1915.

Application filed July 14, 1914. Serial No. 850,892.

To all whom it may concern:

Be it known that I, WILLIAM HUBELI WALDRON, a citizen of the United States, and a resident of Highland Park, in the county of Middlesex and State of New Jersey, have invented a new and Improved Border-Cutting Machine, of which the following is a full, clear, and exact description.

The invention relates to the manufacture of wall paper, and its object is to provide a new and improved border cutting machine arranged to enable the attendant to keep the design printed on the border in register with the cutting roll, to insure accurate cutting of the border along the contour of the imprint.

In order to accomplish the desired result use is made of an impression roll, a cutting roll operating in conjunction with the said impression roll and having a continuous cutting edge conforming in shape to the contour of the imprint of the border, a differential driving gear for driving the said cutting roll from the said impression roll, an electrically controlled brake mechanism for said driving gear to retard or accelerate the rotation of the cutting roll relatively to the impression roll, and a circuit closer for the said brake mechanism and controlled by the travel of the border.

A practical embodiment of the invention is represented in the accompanying drawings forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the views.

Figure 1 is a side elevation of the border cutting machine; Fig. 2 is a cross section of the same on the line 2—2 of Fig. 1; Fig. 3 is a sectional plan view of the same on the line 3—3 of Fig. 1; Fig. 4 is an enlarged cross section of the electric circuit closer and adjacent parts; Fig. 5 is a sectional side elevation of the same on the line 5—5 of Fig. 4; Fig. 6 is a perspective view of one of the brushes and Fig. 7 is a front elevation of the border-cutting machine.

The border cutting machine is mounted on a suitably constructed frame A on which are journaled the cutting roll B and the impression roll C, between which passes the border D to be cut along one edge according to the contour of the imprint on the paper, it being understood that the cutting roll B is provided with a continuous cutting edge conforming in shape to the contour of the said imprint. The border D passes over and under a series of guide rollers E, E′, E^2, E^3 and E^4 journaled on the main frame A, and the border after leaving the guide roller E^4 passes over a roller F prior to passing between the cutting roll B and the impression roll C. The cut border after passing between the rolls B and C passes between rolls C and G at the delivery side of the machine and finally passes between guide rolls G′, G^2 to a suitable place of discharge.

The guide roller F previously mentioned is mounted on a shaft F′ driven by gear wheels F^2, F^3 and F^4 from the shaft C′ of the impression roll C to cause the roller F to rotate in unison with the said impression roll C. On the shaft F′ adjacent to one end of the roll F is mounted to rotate loosely a sprocket wheel H provided with radially disposed sprockets or pins H′ adapted to engage apertures D′ arranged alongside the edge of the border D opposite the one that is cut by the cutting roll B. Each sprocket H′ is pressed on by a spring H^2 in an outward direction so that the sprockets are free to yield radially to readily engage the apertures D′ of the border D. The hub H^3 of the sprocket wheel H is provided with an arm I of fiber, hard rubber or other suitable insulating material and on this arm is mounted a transversely extending contact pin I′ fulcrumed between spring-pressed contact levers J, J′ fulcrumed on an arm J^2 of fiber, hard rubber or other suitable insulating material, and secured to a hub J^3 fastened on the shaft F′ so as to rotate with the same. Each of the contact levers J and J′ is pressed on by a spring J^4, and a set screw J^5 mounted on the arm J^2 serves to adjust the said levers J, J′ relative to the contact pin I′. Normally the contact pin I′ is out of contact with the levers J, J′, but whenever the border D is retarded or accelerated then the pin I′ moves into contact with either of the levers J, J′ to close an electric circuit presently to be described in detail. On the hubs H^3 and J^3 are secured ring H^4, J^6, of hard rubber or other insulating material and surrounded by commutator rings H^5, J^7 of brass or other material. The rings H^5, J^7 are engaged by the free ends of brushes K, K′ adjustably secured by set screws K^2 on a pin K^3 held on a bracket K^4 attached to the main frame A, as plainly

shown in Fig. 1. The commutator ring H^5 is connected by a wire L with the pin I', and the commutator ring J^7 is connected by wires L' with the contact levers J, J'. The brushes K, K' are provided with binding posts K^5 engaged by circuit wires L^2, L^3, of which the circuit wire L^3 is connected with a battery L^4 or other suitable source of electrical energy. The wires L^2, L^3 connect with electric magnets N mounted on a bracket N' attached to the main frame A, and the armature lever N^2 for the said electromagnets N is pressed on by a spring N^3 to hold the armature lever normally in an open position against an adjustable stop N^4 arranged on the bracket N', as shown in Fig. 1.

The armature lever N^2 is provided with an upwardly extending integral pawl N^5 adapted to engage a gear wheel O' forming part of a differential gearing O mounted on a bracket A' held on the main frame A (see Figs. 1, 2 and 3). The gear wheel O' is mounted to rotate loosely on a driven shaft O^2 journaled in the bracket A', and on the said gear wheel O' is mounted to rotate a bevel gear wheel O^3 in mesh at opposite sides with bevel gear wheels O^4, O^5, of which the gear wheel O^4 is secured on the shaft O^2 while the gear wheel O^5 is mounted to rotate loosely on the said shaft O^2. On the gear wheel O^5 is secured a sprocket wheel P connected by a sprocket chain P' with a sprocket wheel P^2 attached to the hub of a bevel gear wheel P^3 secured on a sleeve C^2 fastened to the shaft C' of the impression roll C. The bevel gear wheel P^3 is connected by a return gearing U with the gear wheel F^4 in mesh with the gear wheel B^2 on the shaft B' of the cutting roll B. This return gearing, as the differential gearing O before mentioned, is more fully set forth in the Letters Patent of the United States for a registering device for printing machines, No. 805,172, granted to me on November 21, 1905, so that further detail description of the said return gearing is not deemed necessary. The impression roll C is provided with a gear wheel Q (see Fig. 2) in mesh with a gear wheel Q' mounted on a main driving shaft Q^2 carrying a pulley Q^3 connected with other machinery for imparting a rotary motion to the driving shaft Q^2 which by the pinion Q' and the gear wheel Q rotates the shaft C' and the impression roll C. The rotary motion given to the shaft C' is transmitted by the sprocket wheel P^2, sprocket chain P' and sprocket wheel P to the bevel gear wheel O^5 to rotate the latter.

The shaft O^2 is provided with a pulley R connected by a crossed belt R' with a pulley R^2 secured on a main shaft pulley S journaled in suitable bearings on the main frame A (see Fig. 3). The pulley S is connected by a belt S' with a cone-shaped pulley S^2 likewise journaled on the main frame A, and the said pulleys S and S^2 are disposed with their ends in opposite directions, as will be readily understood by reference to Fig. 3. The pulley S^2 is connected by a pulley S^3, belt S^4 and pulley S^5 with the shaft C' of the impression roll C, to impart a rotary motion to the pulleys S^2 and S with a view to drive the shaft O^2 by the pulley and belt connection R, R' and R^2. The belt S' is adapted to be shifted laterally so as to vary the speed at which the shaft O^2 is driven from the impression roll C and for this purpose the belt S' is engaged by a belt shifter S^6 mounted to slide transversely on a suitable guideway S^7 attached to the main frame A. In the belt shifter S^6 screws a transversely extending screw rod T journaled on the guideway S^7 and provided at one end with a bevel gear wheel T' in mesh with a bevel gear wheel T^2 secured on a shaft T^3 journaled in suitable bearings on one side of the main frame A. The shaft T^3 is provided with a hand wheel T^4 under the control of the operator for turning the shaft T^3 with a view to rotate the screw rod T to move the belt shifter S^6 transversely with a view to shift the belt S' on the cone pulleys S, S^2.

The armature lever N^2 may be locked in closed position by a locking arm V (see Figs. 1, 2 and 3) secured on a shaft V' journaled on the main frame A and provided with a crank arm V^2 connected by a link V^3 with a bell crank lever V^4 connected by a link V^5 with a foot pedal V^6 under the control of the operator. The spring V^7 on the link V^5 normally holds the pedal V^6 in uppermost position so that the locking arm V is normally a distance above the armature lever N^2 and does not interfere with the working thereof. When it is desired, however, to lock the armature lever N^2 then the operator on pressing the treadle V^6 causes the arm V to swing downward into engagement with the armature lever N^2 to move the pawl N^5 thereof in engagement with the gear wheel O' to lock the latter against rotation.

The operation is as follows: Normally the armature lever N^2 is in open position, that is, with the pawl N^5 out of engagement with the gear wheel O', the pin I' then standing intermediate the contact levers J and J'. The border D prior to passing between the rolls B and C passes over the roller F, and the apertures D' of the border D engage the sprockets H' of the sprocket wheel H. Now as long as the sprockets H' properly register with the apertures D' the pin I' remains intermediate the contact levers J and J', but in case the speed of the border D is retarded or accelerated then the sprocket wheel H is caused to turn slower or faster

relative to the roll F driven from the impression roll C and consequently the pin I′ makes contact with either of the contact levers J or J′. Whenever this takes place the circuit for the electromagnets N is closed and the armature lever N^2 is attracted against the tension of the spring N^3 so that the pawl N^5 engages the gear wheel O′ and holds the same against rotation. When this takes place the speed transmitted to the cutting roll B is retarded or accelerated and consequently that of the border D until normal speed is reached, at which time the sprocket wheel H again moves the pin I′ into intermediate position relative to the levers J and J′. When this takes place the circuit is broken and the electromagnets N are deënergized to allow the spring N^3 to return the armature lever N^2 to normal open position, that is, to move the pawl N^5 out of engagement with the gear wheel O′. The latter is now again free to rotate.

From the foregoing it will be seen that the speed of the cutting roll B is automatically retarded or accelerated to insure a proper registering of the cutting edge of the cutting roll B relative to the contour of the design on the border D, the variation in the speed being very gradual owing to the stopping and releasing of the gear wheel O′ by the pawl N^5 of the armature lever N^2.

In case the discrepancy between the cutting edge of the roll B and the contour of the design on the border D becomes too pronounced then the attendant turns the hand wheel T^4 either to the right or to the left to shift the belt S′ with a view to vary the speed of the shaft O^2 thus causing the retardation or acceleration of the cutting roll B according to the direction in which the hand wheel T^4 is turned by the attendant.

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

1. A border cutting machine, comprising a driven impression roll, a cutting roll operating in conjunction with the said impression roll and having a continuous cutting edge conforming in shape to the contour of the imprint on the border, a differential driving gear for driving the said cutting roll from the said impression roll, an electrically controlled brake mechanism for the said driving gear to retard or accelerate the rotation of the cutting roll relative to the impression roll, and a circuit closer for the said brake mechanism and controlled by the travel of the border.

2. A border cutting machine, comprising a driven impression roll, a cutting roll operating in conjunction with the said impression roll and having a continuous cutting edge conforming in shape to the contour of the imprint on the border, a differential driving gear for driving the said cutting roll from the said impression roll, an electrically controlled brake mechanism for the said driving gear to retard or accelerate the rotation of the cutting roll, a circuit closer for the said brake mechanism and controlled by the travel of the border, and a manually controlled speed-changing device for the said differential driving gear to vary the speed thereof.

3. A border cutting machine provided with a cutting roll having a continuous edge conforming in shape to the contour of the imprint on the border, a differential driving gear for driving the said cutting roll from the said impression roll, a sprocket wheel mounted to turn loosely and having sprockets adapted to engage apertures along the margin of the border to turn the sprocket wheel by the advancing border, and means actuated by the said sprocket wheel to vary the speed of the said differential driving gear.

4. A border cutting machine provided with a cutting roll having a continuous edge conforming in shape to the contour of the imprint on the border, a differential driving gear for driving the said cutting roll from the said impression roll, a sprocket wheel mounted to rotate loosely and arranged in front of the said rolls, the said sprocket wheel having sprockets adapted to engage apertures in the margin of the border to turn the sprocket wheel by the advancing border, an electromagnet having an armature lever adapted to engage a member of the said driving gear to vary the speed of the driving gear, and a circuit closer for the said electromagnet and controlled by the said sprocket wheel.

5. A border cutting machine provided with a cutting roll having a continuous edge conforming in shape to the contour of the imprint on the border, a differential driving gear for driving the said cutting roll from the said impression roll, a sprocket wheel mounted to rotate loosely and arranged in front of the said rolls, the said sprocket wheel having sprockets adapted to engage apertures in the margin of the border to turn the sprocket wheel by the advancing border, an electromagnet having an armature lever adapted to engage a member of the said driving gear to vary the speed of the driving gear, a circuit closer for the said electromagnet and controlled by the said sprocket wheel, and a manually controlled speed changing device for the said driving gear.

6. A border cutting machine provided with a cutting roll having a continuous edge conforming in shape to the contour of the imprint on the border, a differential driving gear for driving the said cutting roll from the said impression roll, a sprocket wheel mounted to rotate loosely and a

ranged in front of the said rolls, the said sprocket wheel having sprockets adapted to engage apertures in the margin of the border to turn the sprocket wheel by the advancing border, an electromagnet having an armature lever adapted to engage a member of the said driving gear to vary the speed of the driving gear, a circuit closer for the said electromagnet and controlled by the said sprocket wheel, and a manually controlled locking device for the said armature lever to lock the latter in inactive position.

7. A border cutting machine provided with a cutting roll having a continuous edge conforming in shape to the contour of the imprint on the border, a differential driving gear for driving the said cutting roll from the said impression roll, the said driving gear having a speed compensating device, including a carrier gear wheel, an electromagnet having a spring-pressed armature lever adapted to engage the said gear wheel to lock the latter against movement, a circuit closer for the said electromagnet and having two contact levers and a contact pin intermediate the said levers to make contact with either contact lever, a support for the said contact levers and rotating in unison with the said impression roll, and a support for the said contact pin and driven by the said border.

8. The combination with a driven shaft of a sprocket wheel loose on the shaft and having its sprockets adapted to engage apertures on the margin of a traveling sheet, a carrier rotating with the said shaft and carrying contact levers, and a pin rotating with the said sprocket wheel and extending between the said contact levers to make contact on retarding or accelerating the traveling motion of the said sheet.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

WILLIAM HUBELI WALDRON.

Witnesses:

HERBERT M. WALDRON,

W. J. FRANCKE.