J. BARDET.

CUTTING APPARATUS FOR WEB PRINTING MACHINES.

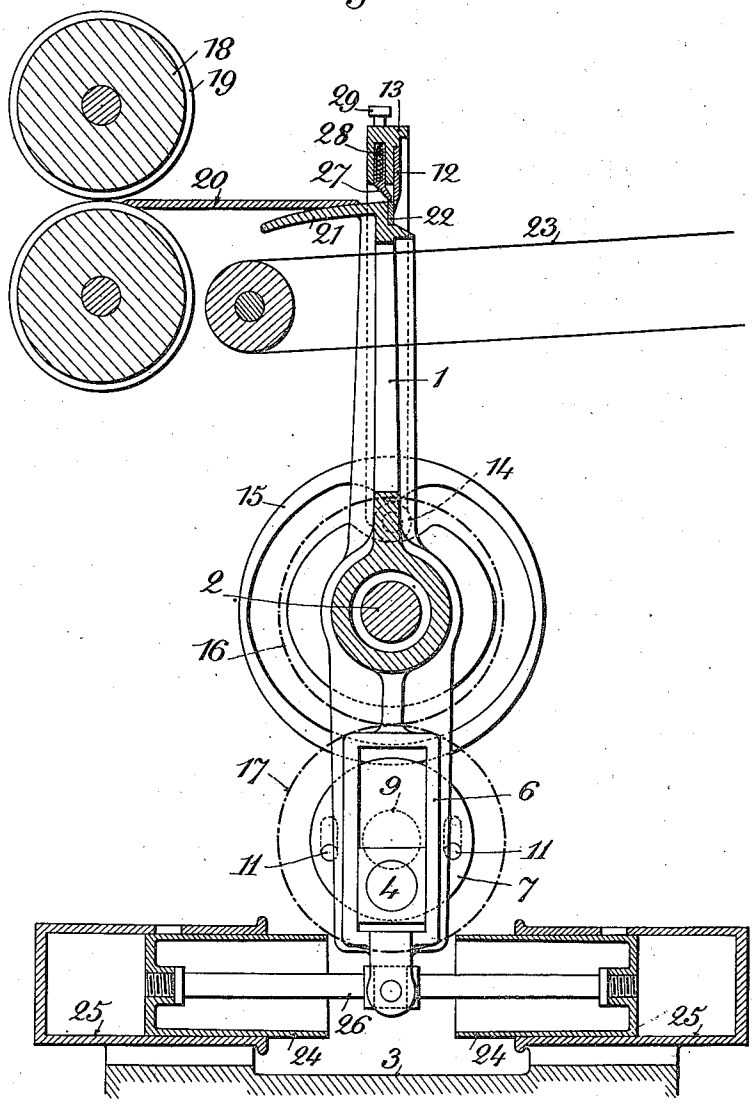
APPLICATION FILED JULY 17, 1913.

1,174,041.

Patented Mar. 7, 1916.

2 SHEETS—SHEET 1.

Fig. 1.



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2 SHEETS—SHEET 2.

Fig. 2.

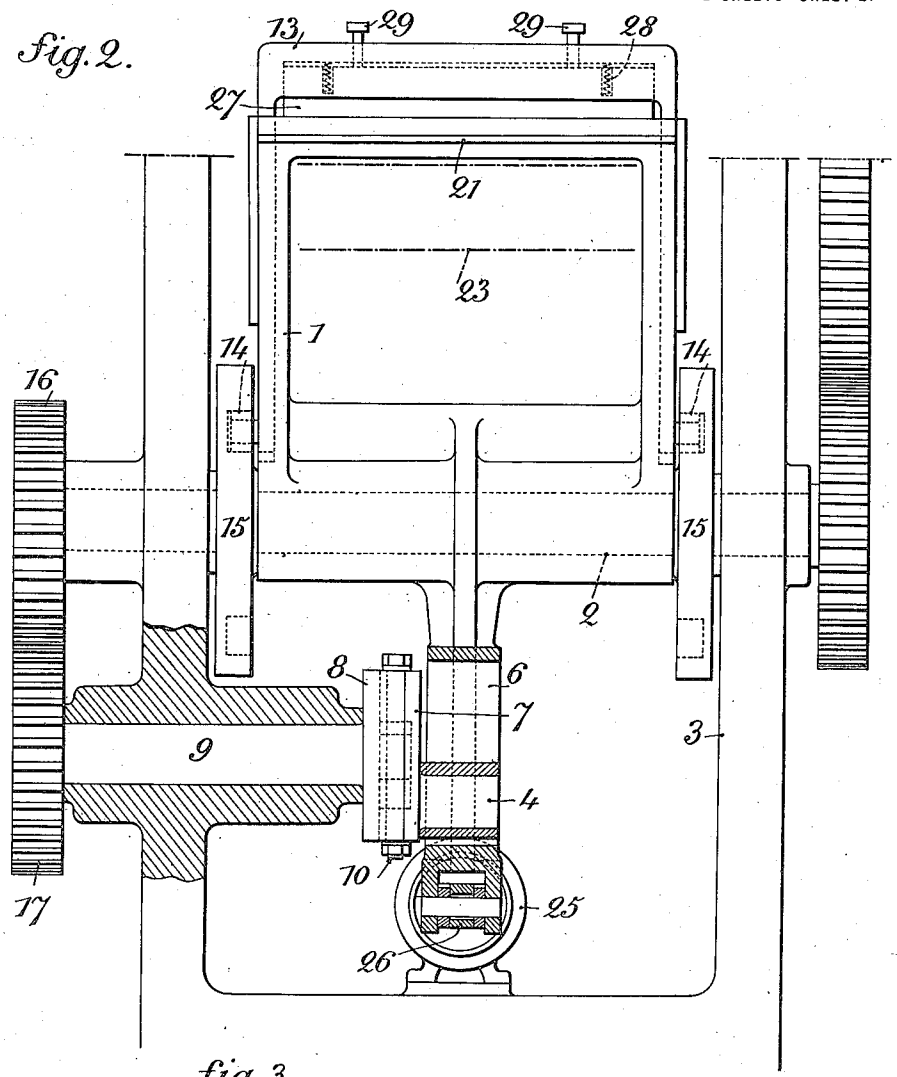
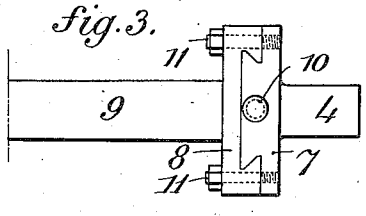


Fig. 3.



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UNITED STATES PATENT OFFICE.

JEAN BARDET, OF PARIS, FRANCE, ASSIGNOR TO DOBSON, MOLLE & CO., LIMITED, OF EDINBURGH, SCOTLAND, A LIMITED COMPANY INCORPORATED UNDER THE BRITISH COMPANIES ACTS, 1862 TO 1898.

CUTTING APPARATUS FOR WEB-PRINTING MACHINES.

1,174,041. Specification of Letters Patent. Patented Mar. 7, 1916.

Application filed July 17, 1913. Serial No. 779,581.

To all whom it may concern:

Be it known that I, JEAN BARDET, a citizen of the Republic of France, residing at 35 Rue d'Alsace, Paris, in the Republic of France, engineer, have invented certain new and useful Improvements in Cutting Apparatus for Web-Printing Machines, of which the following is a specification.

This invention relates to cutting mechanism applicable to all web printing machines and of the type comprising a knife to which reciprocatory motion is imparted in two directions, one substantially parallel to the movement of the sheet or web to be cut, and the other substantially at right angles to the plane of the said web in such a manner that the cutting operation takes place at the moment when the knife is moving in the same direction and at the same velocity as the web.

This invention has now for its object to provide an improved cutting mechanism of this type which shall be simple in construction, not bulky, and capable of operating at a high speed and not liable to any risk of improper working, either by pushing back the web during the return movement of the knife or through any other cause. Further this improved mechanism allows of regulating easily and with accuracy, the movements of the knife according to the speed of the web to be cut, and the length of the sheets cut therefrom.

According to this invention the cutting mechanism comprises a frame oscillating about a horizontal shaft and carrying at its upper part a curved or arched table or till concentric to the said axis and at its sides slideways for guiding the arms of a U-shaped part which carries the knife; the ends of the said arms being provided with rollers adapted to roll in the grooves of two rotating cams mounted on the shaft of oscillation of the frame. The oscillation of the frame is produced by means of an eccentric rotating synchronously with the cams. At each revolution the eccentric imparts an oscillatory motion to the frame and to the knife, and the cams cause the knife to rise and descend at the desired times for cutting the web, which on leaving the printing machine first slides on to a fixed table and thence on to a curved or arched table or till of the oscillating frame.

The speed of rotation of the eccentric and of the cams is made such that in the interval between two cuts, the web whose speed is constant, will advance the desired distance. This speed of rotation, and consequently the length of the sheets cut from the web may be varied for instance by changing the gear wheels that drive the mechanism from the printing machine. On the other hand the amplitude of oscillation of the frame carrying the knife is regulated in such a manner that the speed of the knife at the time of the cut shall be equal to the speed of the web. This regulation is effected by varying the eccentricity of the eccentric.

The influence of the inertia of the whole of the frame, the U-shaped part and the frame, at each end of its stroke, is not very important owing to the small mass of these parts, and the nature of the motion produced by the eccentric. It may, however, be rendered inappreciable by the use of suitable buffer devices of the compressed air or other type. The improved mechanism is consequently adapted to work very rapidly and give a large output. As its parts are mounted on two shafts only, it can be constructed in very small bulk and dimensions and it can be readily applied to any printing machine. It is also adapted to the use of circular knives for cutting the paper web longitudinally before it arrives at the cutting table of the present mechanism, so that sheets of all sizes can be produced.

One form of this invention is illustrated by way of example in the accompanying drawings in which:

Figure 1 is a vertical section of the improved cutting mechanism; Fig. 2 is a front elevation thereof partly in section; Fig. 3 is a plan of the details of the adjustable eccentric.

As shown, the oscillating frame 1 is mounted loose on a shaft 2 journaled in the two uprights of a framing 3. Its oscillation is produced by means of an eccentric pin 4 engaging in a slide block 5 sliding in a slot formed in an extension 6 of the frame. This pin 4 is fixed to a plate which is composed of two portions 7 and 8, and which is fixed on a shaft 9 likewise mounted in the framing 3. The parts 7 and 8 are connected together in such a manner as to be

capable of sliding one on the other so as to allow of varying the eccentricity of the pin 4. After the part 7 has been adjusted relatively to the part 8 by means of a screw 10, it is fixed by means of bolts 11.

The knife 12 is fixed to the cross limb of an inverted U-shaped part 13 whose vertical limbs are guided in slideways formed in the sides of the frame 1. The ends of these limbs are provided with rollers 14 which work in two similarly grooved cams 15 fixed on the shaft 2. This shaft and the shaft of the eccentric are connected together by means of toothed wheels 16 and 17 of equal diameters. They receive a continuous rotary motion through gearing driven from the printing machine and comprising change gear wheels for other devices which allow of changing the ratio of the gearing when the size of the cut sheets is to be varied.

The web to be cut issues from the printing machine through two rollers 18 which draw it along by means of their circular edges 19. It then slides on to a fixed table 20 ending in a beveled edge, and passes thence on to movable table or till 21, which is fixed to the frame 1 and which is curved or arched concentrically to the shaft 2 in such a manner as to remain in every position approximately flush with the beveled edge of the fixed table 20. The web will thus always arrive tangentially on this movable table and will pass between the limbs of the inverted U-shaped part 13. When the knife moves down it slides along a guard blade 22 mounted at the front edge of the table or till 21, and the severed sheet falls then upon an endless conveyer 23 which extends within frame 1.

The grooves of the cams are shaped in such a manner as to produce the maximum rise of the knife at the ends of the oscillations of the frame, and the descent of the knife at the moment when the frame is nearing the middle of its stroke in its advance in the same direction as the web.

For the purpose of doing away with the injurious effects of inertia upon the mechanism, two pistons 24 movable in fixed cylinders 25 and coupled together by a rod 26 are connected to the lower end of the arm 6 so that at each end of the stroke of the frame they will compress a quantity of air in one or the other cylinder. It is, however, to be understood that any other buffering device may be employed equally well.

With the knife there coöperates in a known manner a pressing apparatus which serves to prevent the knife from carrying up the sheet in its ascent, comprising a blade 27 which is under the action of springs 28, and stop rods 29 which limit the descent of said blade.

Claims:

1. In cutting mechanism for web printing machines of the specified type, comprising, a horizontal axis, a swinging frame on such axis, an arched table or till concentric to the said axis at the upper part of the frame, an inverted U-shaped strap slidably guided on said frame and of which the transverse part passes above the table or till, a knife carried by such transverse part of the strap, means whereby to swing the said frame, and means to raise and lower the said strap on such frame.

2. A cutting mechanism for web printing machines of the specified type, comprising a horizontal axis, a swinging frame on such shaft, an arched till concentric to the said axis at the upper part of the said frame, an inverted U-shaped strap slidably guided on the said frame and of which the transverse part passes above the said till, a knife carried by such transverse part of the strap, means whereby to swing the said frame, cams mounted on the swinging axis of the frame and engaging the ends of the said strap, and means for revolving or turning such cams.

3. A cutting mechanism for web printing machines of the specified type, comprising a horizontal axis, a swinging frame on such shaft, an arched till concentric to the said axis at the upper part of the said frame, an inverted U-shaped strap slidably guided on the said frame and of which the transverse part passes above the said till, a knife carried by such transverse part of the strap, the said swinging frame having an arm provided with a downwardly extending groove, a shaft parallel to the swinging axis of the frame, a radially adjustable eccentric on such shaft engaged in the groove of the said arm, means to revolve the said shaft, and means whereby to raise and lower the said strap on the swinging frame once at each revolution of the said shaft.

4. A cutting mechanism for web printing machines of the specified type, comprising a horizontal axis, a swinging frame on such shaft, an arched till concentric to the said axis at the upper part of the said frame, an inverted U-shaped strap slidably guided on the said frame and of which the transverse part passes above the said till, a knife carried by such transverse part of the strap, means for swinging the said frame, means whereby to take up the inertia of the swinging frame at the end of the swinging motions, and means to raise and lower the said strap on the frame.

5. A cutting mechanism for web printing machines of the specified type, comprising a horizontal axis, a swinging frame on such shaft, an arched till concentric to the said axis at the upper part of the said frame, an inverted U-shaped strap slidably guided on the said frame and of which the transverse part passes above the said till, a knife car-

ried by such transverse part of the strap, means for swinging the said frame, means whereby to raise and lower the said strap on such frame, and an endless conveyer passing within such frame, such conveyer being adapted to receive the sheets of paper cut off by the said knife.

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

JEAN BARDET.

Witnesses:
HANSON C. COXE,
MAURICE RAUX.