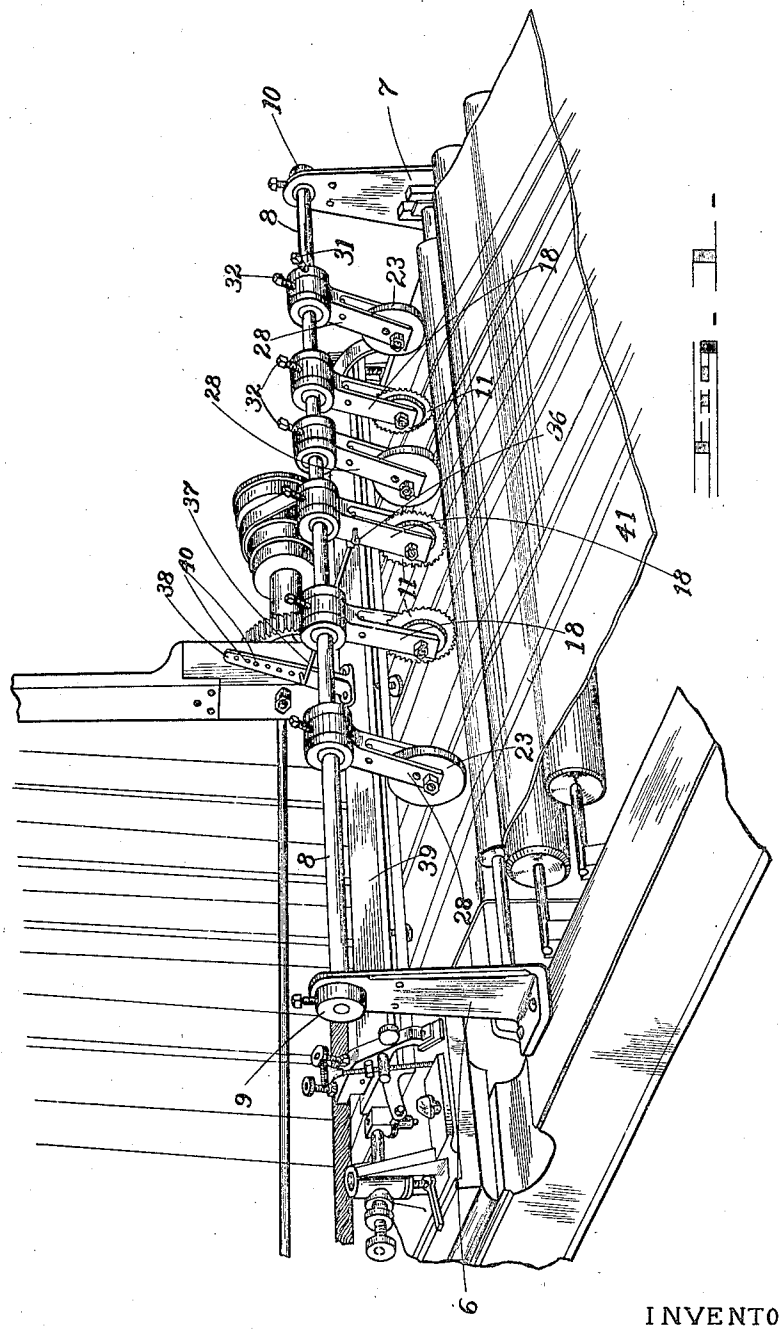
Nov. 13, 1923. 1,473,632

W. G. KNIGHTS

PERFORATING ATTACHMENT FOR RULING MACHINES

Filed April 18, 1922 2 Sheets-Sheet 1



INVENTOR
WILLIAM GEORGE KNIGHTS.
BY E. H. Bond
ATTORNEY

Nov. 13, 1923. 1,473,632

W. G. KNIGHTS

PERFORATING ATTACHMENT FOR RULING MACHINES

Filed April 18, 1922 2 Sheets-Sheet 2

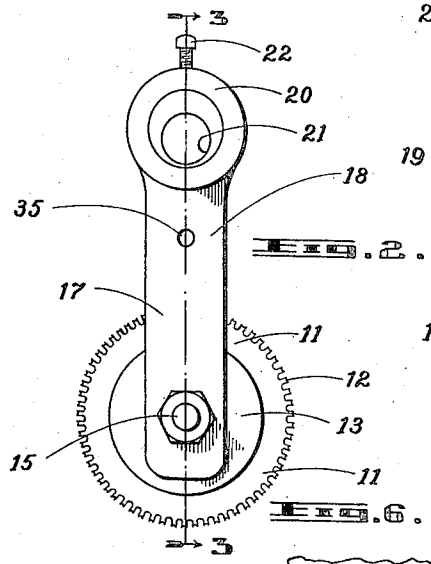


Fig. 2.

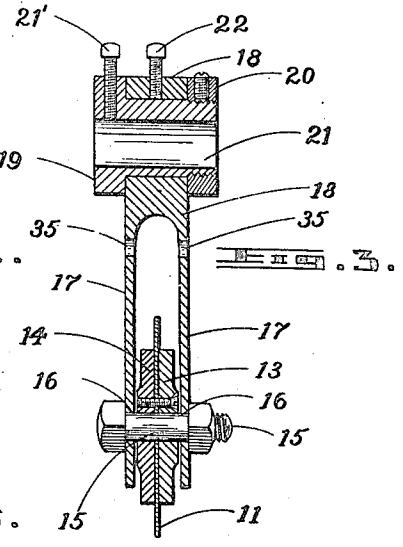


Fig. 3.

Fig. 6.

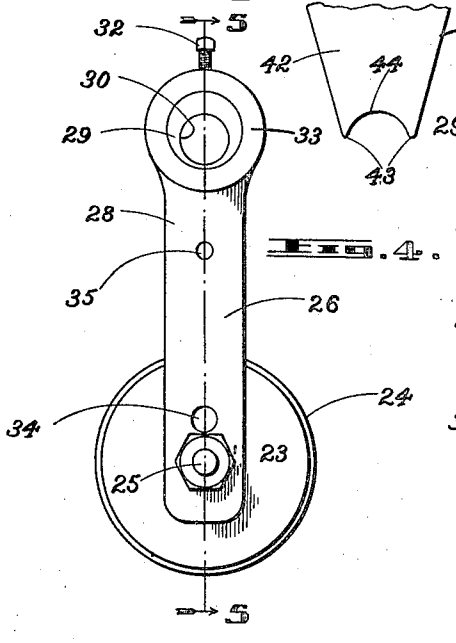


Fig. 4.

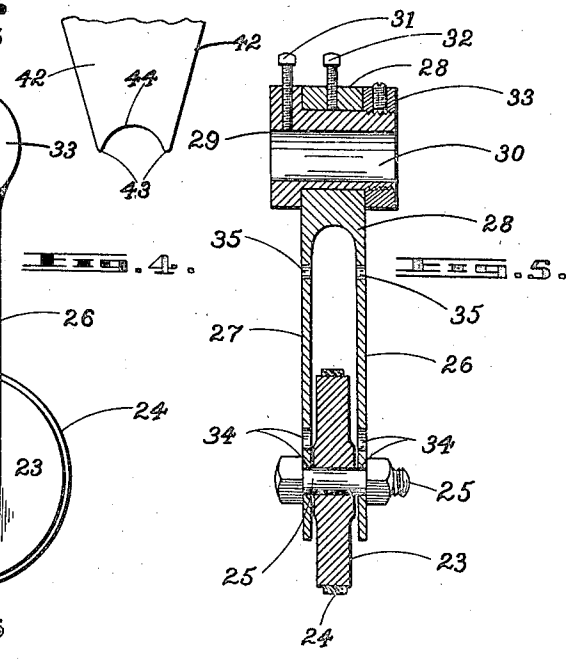


Fig. 5.

INVENTOR
WILLIAM GEORGE KNIGHTS.
BY E. M. Bond
ATTORNEY

Patented Nov. 13, 1923. 1,473,632

UNITED STATES PATENT OFFICE.

WILLIAM GEORGE KNIGHTS, OF CALGARY, ALBERTA, CANADA.

PERFORATING ATTACHMENT FOR RULING MACHINES.

Application filed April 18, 1922. Serial No. 554,663.

To all whom it may concern:

Be it known that I, WILLIAM GEORGE KNIGHTS, a citizen of the Dominion of Canada, and resident of Calgary, in the county of Calgary and Province of Alberta, Dominion of Canada, have invented certain new and useful Improvements in Perforating Attachments for Ruling Machines, of which the following is a specification.

The present invention comprehends the provision of a perforating attachment adapted for use in conjunction with standard types of ruling machines.

The primary object of my invention is to provide a perforating attachment adapted for use in conjunction with standard types of ruling machines and which perforating attachment will operate in synchronism with the ruling mechanism of the machine, thus obviating the necessity of perforating the paper after the same has undergone the ruling operation.

A further object of my invention is to provide an attachment for standard types of ruling machines which will obviate the necessity of a separate perforating operation.

A still further object of my invention is to provide an attachment for standard types of ruling machines, which will enable the ruling machine to be used as a perforating machine, either in conjunction with the ruling operation or as a perforating machine solely, as occasion arises.

These and other objects I accomplish by means of such structure and relative arrangement of parts as will readily appear by a perusal of the following description, the descriptive matter being supplemented by the accompanying schematic illustrations, wherein—

Fig. 1 is a fragmentary perspective view illustrating a portion of a standard ruling machine and the embodiment of my present invention.

Fig. 2 is a side elevation of one of the perforating members.

Fig. 3 is a vertical section as it would appear when taken on line 3—3 of Fig. 2, looking in the direction of the indicating arrows.

Fig. 4 is a side elevation of one of the rotary guide wheels.

Fig. 5 is a vertical section as it would appear when taken on line 5—5 of Fig. 4, looking in the direction of the indicating arrows.

Fig. 6 is a detail of a portion of one of the cutting teeth.

Referring to the drawings in detail, wherein like numerals of reference designate corresponding parts, the numerals 6 and 7 designate brackets, the upper extremities of which are bored for reception of the shaft 8, the same being held in position by the collars 9 and 10. The perforating wheels 11, best shown in Figs. 2 and 3, are adjustably mounted on the shaft 8. The circumferential periphery of each said perforating wheel is serrated as at 12. Each said perforating wheel 11 is clamped intermediate the disks 13 and 14 through which passes the shank of the bolt 15. The said bolt is carried in apertures 16 in the bifurcated end 17 of the bracket 18. The bracket 18 is bored transversely at its upper end and has extending therethrough the bushing 19, which is retained in position by the collar 20. The bushing 19 is provided with an eccentric bore 21, through which the shaft 8 extends. The bushing 19 is held on the shaft 8 by the set screw 21′, while the bracket 18 is held on the bushing 19 by the set screw 22. The purpose of the eccentric bore 21 will be hereinafter explained.

The guide members constitute the rollers 23, which are provided with a rubber or similar composition on the outer circumferential peripheries thereof, as designated by the numeral 24. Each roller 23 is rotatably mounted on the shank of a bolt 25, which extends through apertures disposed in the sides 26 and 27 of a bracket 28. The bracket 28 is bored transversely at its upper end and has extending therethrough the bushing 29, which is provided with the eccentric bore 30. The shaft 8, shown in Fig. 1, extends through the eccentric bore 30 and the bushing 29 is held in position by the set screw 31. The set screw 32 holds the said bracket 28 on the said bushing 29, while the bushing 29 is held in position in the bracket 28 through the medium of the collar 33. The numerals 34 designate apertures drilled in the side members 26 and 27 of the said bracket 28, which provide means whereby the roller 23 may be adjusted in relation to the surface upon which it bears.

The brackets 18 and 28 are provided with apertures 35 disposed in spaced relation to the eccentric bores 21 and 30 of the bushings 19 and 29. As shown in Fig. 1, a cotter pin 36 extends through the said apertures

35 in one of the brackets 18. The connecting rod 37 is pivotally connected on one end to the bracket 18 through the medium of the cotter pin 36, and the opposite end thereof is connected to the bracket 38 mounted on the pen beam 39, which is oscillated by associated mechanism of the ruling machine. This pen beam 39 carries the pens and ink which perform the ruling operation.

In operation, the pen beam 39 carrying the ruling mechanism, oscillates in unison with the associated mechanism of the machine. When the pens of the beam 39 strike the paper to perform the ruling operation, this striking movement is imparted to the perforating mechanism through the medium of the connecting rod 37, thereby causing operation of the perforating mechanism in synchronism with the ruling mechanism of the machine. The guide rollers 23 are also operated in synchronism to guide the paper on its travel on the blanket 41. A plurality of apertures 40 are drilled in the bracket 38 to provide a means for adjustably connecting thereto the connecting rod 37 for varying the oscillating movements imparted to the perforator. This bracket 38 works in conjunction with the oscillating movement of the existing pen beam 39, thereby causing lifting and raising of the perforating wheels in a congruent manner to the ruling pens which perform the ruling operation. This enables the machine to run one or more perforations right through from end to end of the sheet or one or more perforations picking up and dropping at any desired point on the sheet, or one or more perforations right through the sheet and one or more perforations picking up and dropping at any desired point at one and the same time.

The depth of the perforations may be regulated to comply with various grades of paper by adjusting the bushing 19 carrying the perforating wheels. One of the teeth forming the serrated edge is shown in detail in Fig. 6 and it will be noted that the sides 42 of the tooth converge toward the cutting face of the tooth. The cutting face provides side extensions 43, leaving an arcuate face 44 intermediate thereof. When it is desired to dot-perforate, the bushing 19 is so adjusted on the shaft 8 as to allow only the side extensions 43 to enter the paper. If a slightly heavier dot-perforation is desired, the bushing 19 is turned on the shaft 8 and through the medium of the eccentric bore 21, the cutting face is caused to lower, thus providing a deeper cut of the side extensions. If a dash-perforation is desired, the adjustment is made whereby the side-extensions and the arcuate face both cut through the paper. The brackets carrying the guide rollers are adjusted to keep the paper in proper order when undergoing the perforating operation.

It is obvious that any number of perforating elements and guide rollers may be carried on the shaft 8 to form any character of work desired, at the time the sheet is being ruled.

While it is believed that from the foregoing description the nature and advantages of my invention will be readily understood, I desire to have it appreciated that the same is merely an illustration of the preferred embodment of my invention, to which I do not limit myself and that deviations from such details may be resorted to as do not form a departure from the spirit of the invention as defined by the appended claims.

What I claim as new is:

1. The combination with the pen beam of the ruling mechanism and a supporting shaft of a ruling machine, of perforating wheels carried by said shaft and means to connect said perforating wheels for operation with the pen beam.

2. The combination with the paper guiding means of a ruling machine, of a shaft supported transversely above the paper guiding means, perforating wheels and guide rollers, supporting brackets for said perforating rollers and guide rollers, bushings for said brackets, means for adjustably mounting said brackets on said bushings and means for adjustably mounting said bushings on said shaft.

3. The combination with the paper guiding means of a ruling machine, a rock shaft extended transversely above said paper guiding means and the ruling mechanism of said ruling machine, of perforating wheels and guide rollers, separate brackets for said perforating wheels and said guide rollers, means for adjustably mounting said brackets on said rock shaft and means for adjustably connecting said brackets to said ruling mechanism for operation in synchronism therewith.

4. The combination with the paper guiding means of a ruling machine, the rock shaft mounted opposite said paper guiding means and the ruling mechanism of said ruling machine, of perforating wheels and guide rollers, separate brackets for said perforating wheels and said guide rollers, bushings extended through said brackets, means for locking said brackets in adjusted position on said bushings, means for locking said bushings in adjusted position on said shafts to regulate the position of the said perforating wheels and the said guide rollers with respect to the said paper guiding means, said perforating wheels and guide rollers being adapted to operate independently of said ruling mechanism and means to connect said brackets with the ruling mechanism for operation in synchronism therewith.

5. The combination with a ruling machine including a pen beam and a rock

shaft, of perforating wheels carried by said rock shaft and operating independently of the said pen beam, said perforating wheels being adapted to be connected at times with said pen beam for operation in synchronism therewith.

6. The combination with a ruling machine having a rock shaft and a ruling mechanism including a pen beam, of a perforating mechanism including perforating wheels carried by said rock shaft and operating independently of the ruling mechanism, means carried by said shaft for guiding paper undergoing the perforating operation and means to connect the perforating wheels with the pen beam for operation in synchronism therewith.

7. The combination with a ruling machine including a pen beam, of a perforating mechanism for said machine, said perforating mechanism comprising a rock shaft, means for guiding ruled paper from beneath the pen beam past the rock shaft, perforating wheels carried on said rock shaft and adjustable longitudinally thereof, guide rollers carried on said rock shaft and adjustable longitudinally thereof, means for retaining said perforating wheels and said guide rollers in adjusted position on the rock shaft with respect to the paper guiding means to regulate the perforating action of the perforating wheels, said perforating wheels normally operating independently of the pen beam and means for forming a connection between said perforating wheels and the pen beam to cause operation of said perforating wheels in synchronism with the operation of the pen beam.

8. The combination with a ruling machine including a pen beam, of a rock shaft, means for guiding a ruled sheet from the pen beam past the rock shaft and in spaced relation thereto, guide rollers carried by said rock shaft for contact with said paper passing the rock shaft, perforating wheels carried by said rock shaft, said rock shaft being adapted to operate independently of the pen beam, means for forming operative connections between the said pen beam and the said rock shaft to cause operation of the rock shaft and the perforating wheels in synchronism with the operation of the pen beam and means whereby the said perforating wheels may be adjusted on the said rock shaft to impart impressions of the required depth from end to end of the sheet passing the rock shaft.

9. The combination with a ruling machine including a pen beam, of a rock shaft, means for guiding a ruled sheet from the pen beam past the rock shaft and in spaced relation thereto, guide rollers carried by said rock shaft for contact with said paper passing the rock shaft, perforating wheels carried by said rock shaft, said rock shaft being adapted to operate independently of the pen beam, means for adjustably connecting the said perforating wheels with the pen beam to cause the said perforating wheels to be dropped and lifted as predetermined during operation of said pen beam, thereby imparting impressions from and to selected points on the sheet and means whereby the said perforating wheels may be adjusted on the said rock shaft to impart impressions of the required depth from end to end of the sheet passing the rock shaft.

In testimony whereof I affix my signature.

WILLIAM GEORGE KNIGHTS.