J. W. BALL.

PERFORATING ATTACHMENT FOR RULING MACHINES.

APPLICATION FILED DEC. 23, 1908.

927,400.

Patented July 6, 1909.

2 SHEETS—SHEET 1.

Fig. 1.

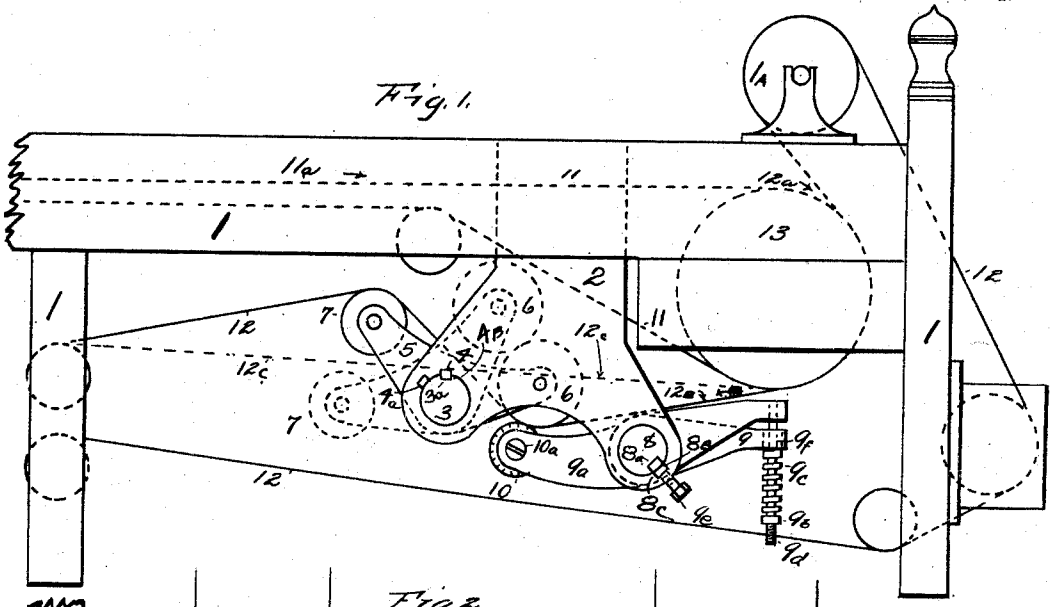
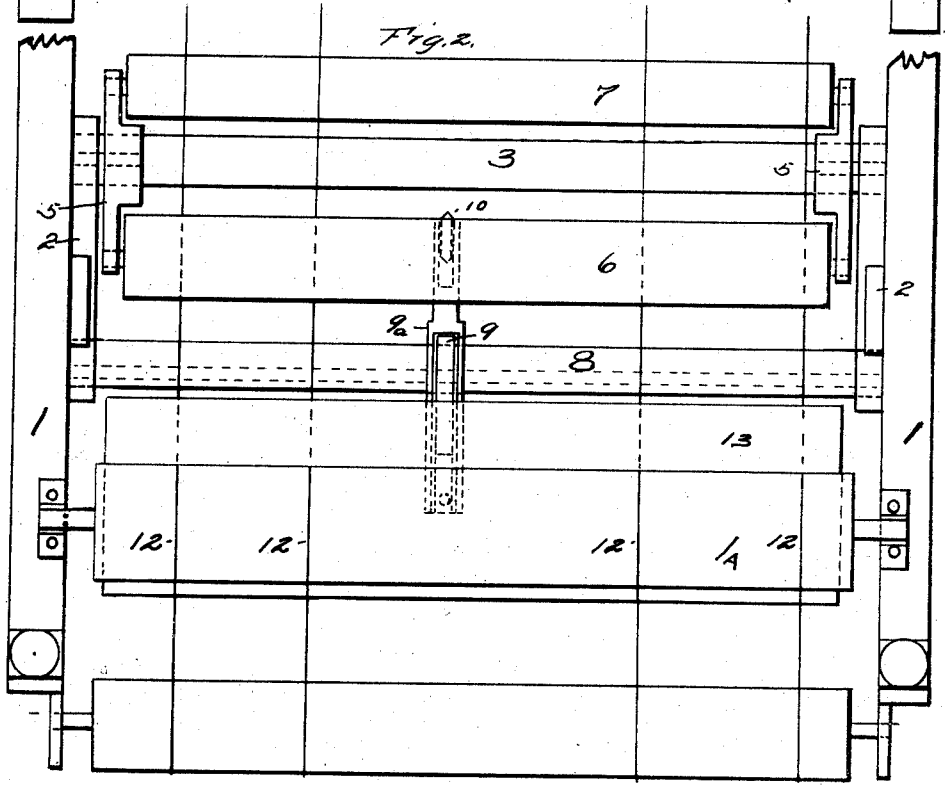


Fig. 2.



WITNESSES:

Joseph C. Stack.

H. Howard Duyle

INVENTOR.

James W. Ball

BY

E. H. Bond

ATTORNEY.

ANDREW. B. GRAHAM CO., PHOTO-LITHOGRAPHERS, WASHINGTON, D. C.

J. W. BALL.

PERFORATING ATTACHMENT FOR RULING MACHINES.

APPLICATION FILED DEC. 23, 1908.

927,400. **Patented July 6, 1909.**

2 SHEETS—SHEET 2.

FIG. 3

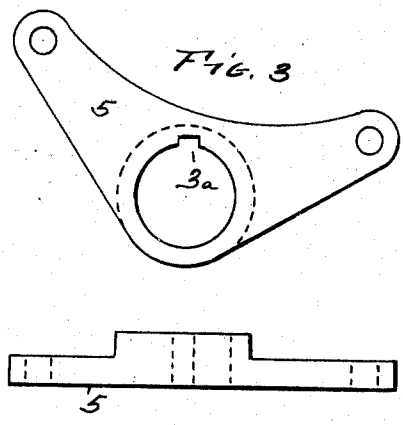
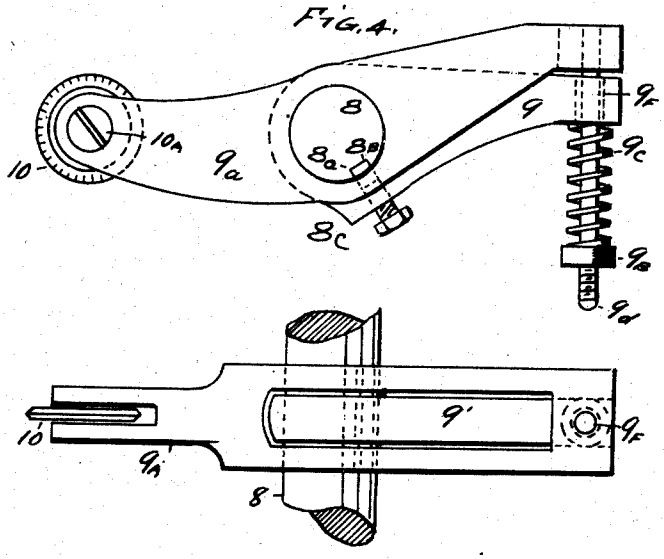


FIG. 4.



WITNESSES:

Joseph C. Stack.

H. Gwen Doyle

INVENTOR.

James W. Ball

BY

E. W. Bond

ATTORNEY.

ANDREW B. GRAHAM CO., PHOTO-LITHOGRAPHERS, WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

JAMES WILLIAM BALL, OF LOGANSPORT, INDIANA.

PERFORATING ATTACHMENT FOR RULING-MACHINES.

No. 927,400. Specification of Letters Patent. Patented July 6, 1909.

Application filed December 23, 1908. Serial No. 469,020.

To all whom it may concern:

Be it known that I, JAMES WILLIAM BALL, a citizen of the United States, residing at Logansport, in the county of Cass and State of Indiana, have invented certain new and useful Improvements in Perforating Attachments for Ruling-Machines, of which the following is a specification.

This invention relates to the attachment of a perforating or impressing device to a machine designed for ruling paper, in such a manner that the operation of perforating or impressing is accomplished simultaneously, or at the same handling, with the operation of ruling, thus obviating the necessity of a second handling of the paper, as has heretofore been the case when both operations were necessary.

In paper ruling machines the sheets of paper are fed singly into the machine, and are carried past the ruling pens or disks by means of a cloth, tapes or cords, the method varying in machines of different makes, but the principle of operation remaining the same. After the sheets have been ruled they are carried forward by said cloth, tapes or cords for a greater or less distance; in some cases twice or three times the length of the machine, doubling back and forth, in order to allow the ink to dry before the sheets are piled up in the receiving box. The work which my invention is designed to accomplish is the perforation of the sheets of paper as they pass the ruling machine, in order that they may be easily divided upon the perforated line; allowing the mechanism of the ruling machine to carry the sheets into and through the perforating device.

My improvement is shown in the accompanying drawings and explained in the following paragraphs.

Figure 1 is a side elevation of the complete device, showing the manner of attachment to the ruling machine. Fig. 2 is a plan view of the complete device. Fig. 3 shows a side and edge elevation of the rocker arm 5. Fig. 4 shows a side and edge elevation of the head 9 and carriage 9^a.

Like reference characters indicate like parts in all the views.

1 is the frame of the ruling machine.

2 represents the end supports for the perforating device. 3 is a shaft mounted in said end supports, of which there are two, one at each side of the machine. 3^a is a keyseat cut longitudinally in end of said shaft. 4 and 4^a are keyseats cut in said end support 2. 5 is a rocker arm secured permanently, one on each end, to shaft 3, and having rotatably mounted therein a hardened cylinder 6 and a tension or guide cylinder 7. 8 is a shaft mounted in said end supports, and keyed permanently thereto. Said shaft 8 has a keyway or feather 8^a cut its entire length, which keyway engages a key 8^b set in the head 9, permitting said head 9 to slide the whole length of said shaft 8 between the end supports 2 without any circumferential motion. A set-screw 9^e, or other suitable clamping device, holds said head securely in the desired place on said shaft. Said head 9 is placed in a groove or recess in the carriage or holder 9^a, said holder being pivotally mounted on shaft 8, and inclosing said head 9 in said recess between its two sides. Thus the holder 9^a is firmly secured to the head 9 in a horizontal direction, but is free to move circumferentially upon shaft 8, being yieldingly secured, however, to the extension upon head 9 by the adjusting thumb-nut 9^b and spring 9^c, which move upon a threaded bolt 9^d. Pivotally mounted in the forward end of holder 9^a, and arranged to impinge upon the surface of cylinder 6, is the perforating disk 10.

The operation of the device is as follows:—The sheets of paper, having been fed into the ruling machine, are carried past the ruling pens upon the ruling cloth 11, or, in the case of a disk ruler, are carried to the ruling head by tapes or cords, and delivered by them to the feed-rolls thereof, which pass them through said head, and deliver them in turn to another set of tapes or cords; in either case the use of the tapes or cords being to carry the sheet exposed to the air long enough to allow the ink to dry before the sheets are piled in the receiving box. In the case of a disk ruler, this invention could be applied at any place in the course of travel of the sheet, outside of the ruling head. In the case of a pen ruler, such as is illustrated herewith, it becomes necessary to attach the device in such a manner as to engage the sheet after it has been delivered from the ruling cloth to a set of cords or tapes. As the sheet advances through the machine it is carried by the ruling cloth in the direction of the arrow at 11^a. Arriving at the cylinder 13, it changes its course, as indicated at 12^a, following the cloth around the curve of said cylinder 13, being held in close contact there-

with by the cords 12. Said sheet emerges from contact with said cylinder 13 in the position, and traveling in the direction, indicated by the arrow at 12^b. From that point it is carried by the cords 12, which pass under cylinder 6, thus carrying the sheet between said cylinder and perforating disk 10, and submitting it to the action of said disk. As the sheet leaves the perforating disk and cylinder 6 it is carried by the cords 12 obliquely up and over the tension or guide roller, or cylinder, 7, and from thence on through the machine in the regular manner. Said sheet is made to follow the curve of the cords 12 as they pass over cylinder 7 by means of supplementary cords, which are ordinarily found on ruling machines, and which are so arranged that they tend to hold firmly to the said cords 12 any sheet that may have a tendency to curl up and thus leave the said cords 12 and entangle itself in the mechanism of the ruling machine.

One of the principal advantages of my invention is the ease with which it may be placed in a working position, or disengaged therefrom. As will be noted by reference to Fig. 1, the rocker arm 5, when in the position shown by that part of the drawing of said arm which is partially in full line, is so placed as to perform the operation described above; while the dotted outline shows said arm, with the two cylinders 6 and 7 mounted therein, in such a position as to allow the sheet, as it is carried forward on the cords 12, to travel in the ordinary manner, without any deviation from the same plane of motion, as is shown by the horizontal dotted line 12^c. This is accomplished by withdrawing the key 4^b (Fig. 1) from its place in keyseat 3^a and corresponding seat 4, said key being loosely fitted therein, and turning the shaft in its mounting in end supports 2 until said keyseat 3^a coincides with keyseat 4^a, and inserting the key, thus holding the shaft with its rocker arm and cylinders in the position shown by the dotted outline. Changing the device from a working to an idle position necessarily leaves some slack in the cords 12. This is to be taken up by the screw adjustment usually provided on ruling machines as a means of keeping the cords tight. Conversely, it is necessary to loosen said screw adjustment somewhat before turning the device to a working position.

The head 9 is mounted on shaft 8 and adapted to be moved longitudinally thereon, having provided means to secure it firmly at any place on said shaft. Said head consists of a collar with an extension protruding radially from said shaft, and a loose key 8^b, to prevent circumferential motion, said key engaging the feather 8^a, cut in said shaft 8, with setscrew 9^e, or other suitable clamping device to hold it securely in the desired position on said shaft. The extension has a hole 9^f, bored vertically through it, to permit the free passage of the threaded adjusting bolt 9^d. The carriage 9^a is also mounted on shaft 8. The forward end is forked to enable it to hold the perforating disk 10, which is mounted rotatably therein by means of a screw 10^a, or other suitable device. For a considerable portion of its length, extending toward the rear end, said carriage 9^a is recessed, or grooved, entirely through its width, or perpendicular dimension to allow it to straddle the head 9, as shown in Fig. 4, as they both occupy their places on the shaft 8. In the rear end of said carriage is permanently fixed the threaded adjusting bolt 9^d, which extends downward therefrom through the hole 9^f bored in head 9. The carriage 9^a is not keyed to shaft 8, but is free, within certain limits, to move circumferentially thereon. The adjusting screw 9^d, or that portion of its length which extends below the extension of head 9, bears a thumb-nut 9^b, which acts upon a spiral coil spring 9^c, which surrounds said screw. As said thumb-nut 9^b is screwed upward it presses against the spring 9^c, which in its turn presses against the firmly fixed extension of head 9, and pulls yieldingly downwardly the rear end of the carriage 9^a to which said bolt 9^d is fastened. This, of course, moves the forward end of 9^a, carrying the perforating disk 10, upward, thereby causing said disk to impinge more or less firmly upon cylinder 6 as the thumb-nut is raised or lowered on screw 9^d. When it becomes necessary to change the position of the head and carriage on shaft 8, to accommodate sheets of different dimensions, the thumb-nut 9^b is run downward until the spring 9^c is loosened, thereby relieving all tension on both the key 8^b and the disk 10, and allowing said head, when set-screw 9^e is loosened, to slide easily along said shaft 8. It will be understood that the key 8^b is carried along, as said head and carriage are moved on shaft 8, by the sides of carriage 9^a, which encircle said shaft, and inclose said key snugly in the pocket formed by keyways 8^a and 8^c and said sides of said carriage 9^a.

Power may be applied to the cylinders 6 and 7 in any convenient manner. It will be found, ordinarily, that the friction of the cords 12 will be sufficient to cause said cylinders to rotate properly, but in case that should not be sufficient, they may be belted to any convenient part of the ruling machine.

I claim:

1. In a ruling machine, the combination with the frame, of rocker arms mounted therein, cylinders carried by said rocker arms, a transverse shaft, a head mounted to slide lengthwise of said shaft and held against circumferential motion, a holder

pivotally mounted on said shaft and having a groove receiving said head.

2. In a ruling machine, the combination with the frame, of rocker arms mounted therein, cylinders carried by said rocker arms, a transverse shaft, a head mounted to slide lengthwise of said shaft and held against circumferential motion, and a holder pivotally mounted on said shaft and having a groove receiving said head, said holder being free to move circumferentially upon said shaft.

3. In a ruling machine, the combination with the frame, of rocker arms mounted therein, cylinders carried by said rocker arms, a transverse shaft, a head mounted to slide lengthwise of said shaft and held against circumferential motion, and a holder pivotally mounted on said shaft and having a groove receiving said head, said holder being free to move circumferentially upon said shaft, said head having an extension, and means yieldingly securing said holder to said extension.

4. In a ruling machine, the combination with the frame, of rocker arms mounted therein, cylinders carried by said rocker arms, a transverse shaft, a head mounted to slide lengthwise of said shaft and held against circumferential motion, a holder pivotally mounted on said shaft and having a groove receiving said head, said holder being free to move circumferentially upon said shaft, said head having an extension, means yieldingly securing said holder to said extension, and means for holding said head in any desired position on the shaft.

5. In a ruling machine, a frame, end supports, a shaft mounted in said supports, said shaft having a longitudinally disposed key seat in one end and one of the supports having a plurality of key seats, rocker arms permanently secured one on each end of said shaft, a hardened cylinder rotatably mounted therein, a tension cylinder, a shaft mounted in said end supports and permanently keyed thereto, a head, a holder pivotally mounted on the last-named shaft and having a groove receiving said head, means holding said head on its shaft, said shaft having a key way, a key in the head engaging said key way, said holder being free to move circumferentially about its shaft, and a yielding connection between said holder and head.

6. In a ruling machine, the combination with the cylinder and a perforating disk, of a tension cylinder, tapes, feed rolls, ruling cloth for carrying the sheet between the cylinder and perforating disk, and means for causing the sheet to follow the curve of the cords, and means for changing the parts from working to inoperative position.

In testimony whereof I affix my signature in presence of two witnesses.

JAMES WILLIAM BALL.

Witnesses:
WINFIELD S. WINEK,
DORATHY P. STONE.