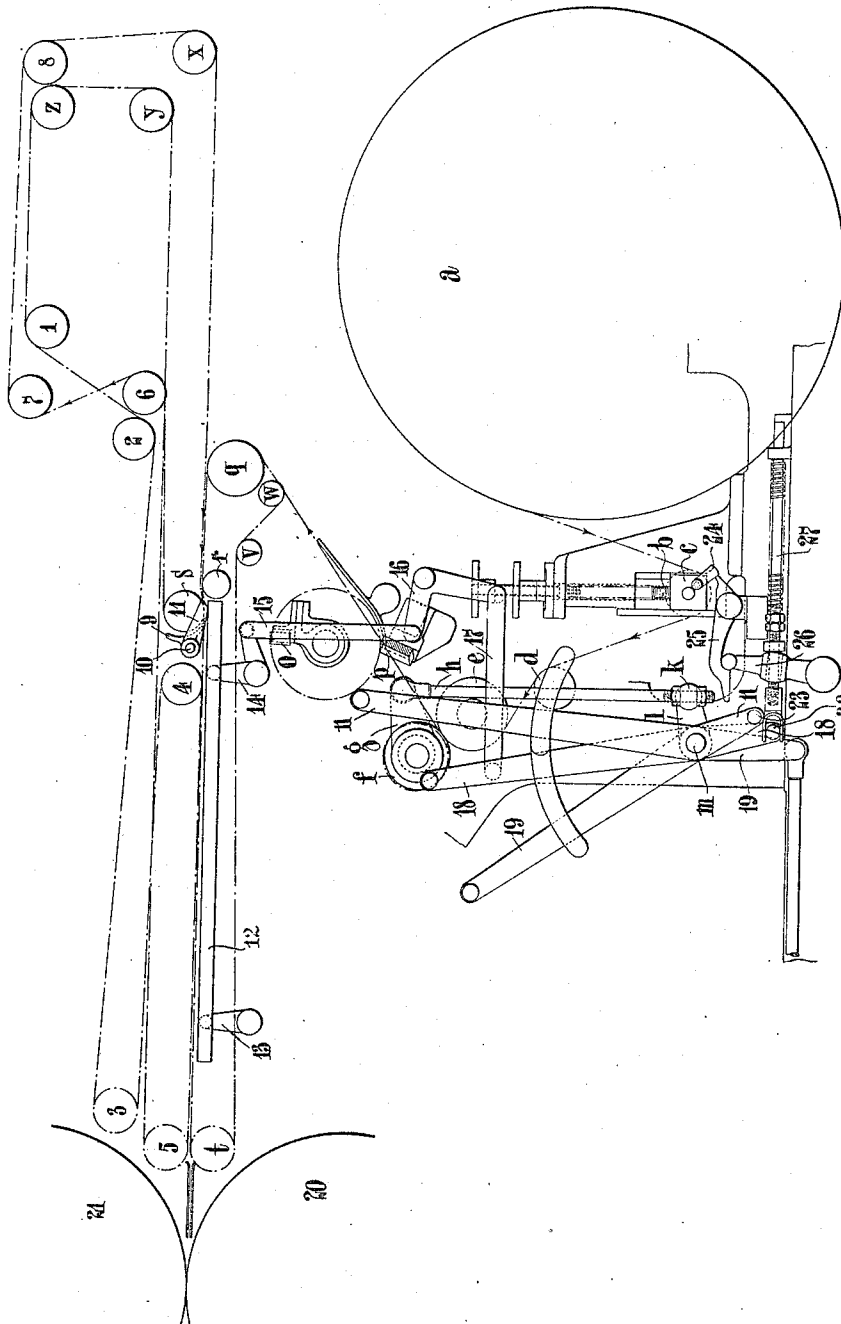


A. B. EVANS.
 PRINTING MACHINERY.
 APPLICATION FILED APR. 6, 1915.

1,237,886.

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PRINTING MACHINERY.

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Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, ARTHUR BURROUGHES EVANS, a subject of the King of Great Britain and Ireland, and residing at High-bank House, Harehills Lane, Leeds, in the county of York, England, have invented certain new and useful Improvements in Printing Machinery, of which the following is a specification.

The present invention relates to printing machinery, and more particularly to all-size web printing machines.

In such machines as heretofore constructed, the nipping or leading rollers which determine the running speed of the web, and are geared to one another and also connected by gearing to the rest of the machine, such latter gearing being alterable in ratio at will, have been mounted in journals in the frame work of the machine, and one pair of these journals carrying one roller has been adjustable to the other pair for the purpose of accommodating different thicknesses of web, such adjustment when once determined being definite and fixed during the continuous working of the machine. In such machines also, the sheets which are divided from the web by cutting, perforating apparatus or the like, are carried forward between lower and upper tapes to the printing cylinders, and no provision has hitherto been made for preventing sheets which may not, as they normally should, reach the gripping mechanism of the machine, at a time when such mechanism is in exact position to receive them, from being introduced uncontrolled, owing to the breakage of the web or otherwise into the running parts of the machine.

The object of the present invention is to provide devices by which wastage of paper, particularly in machines of the lithographic type, can be avoided.

The invention consists in providing means for removing the nip of the nipping or leading rollers from the web, as and when required, without interrupting the continuous revolution of the machine.

The invention also consists in making the adjustable pair of bearings carrying one of the nipping or leading rollers of an eccentric or sliding type, and capable of operation by means of a handle or otherwise during the continuous revolution of the machine.

The invention further consists in provid-

ing a third roller adjustable with the pair of rollers which press the tapes together to take charge of the cut sheet, so that the continuous line of either the upper or the lower tapes may be broken, and the intervening space utilized for the introduction of a sheet tripping device.

The invention also consists in interlocking the handles or the like which operate the adjustable web nipping roller and the sheet tripping devices, so that these can be operated to stop the travel simultaneously, and can be replaced to normal position individually in the order required.

The invention further consists in the improved feed interrupting devices in all-size rotary web printing machinery hereinafter described.

In carrying the invention into effect, according to one example, one pair of the journals carrying one of the nipping or leading rollers is mounted upon an eccentric or slide, which is provided with a handle by which the journals can be moved to remove the nip from the web, during the continuous revolution of the machine. The sheets, after division from the web by cutting, perforating apparatus or the like, are carried forward between upper and lower tapes to a pair of rollers one above and one below both the upper and lower tapes. These rollers, which, as is usual, are adjustable longitudinally to the direction of the sheets, are mounted in such a manner that the upper and lower tapes are pressed together at approximately the point which the front edge of the web has reached when the cutting or perforating is actually taking place. In the carriage carrying the adjustable rollers, there is mounted a third roller, either above or below both the upper and lower tapes, and spaced at a short distance from one of the above named pair of rollers. The continuous line of either the upper or the lower tapes is broken between the third roller and the one of the pair which is on the same side of the tapes, and in this intervening space there is provided a sheet tripping device, which, when required, can be made to interrupt the supply of sheets normally coming through to the gripping mechanism of the machine. The tripping device may be of any suitable form, and is conveniently carried on the carriage which carries the three adjustable rollers. By

means of this device, sheets are prevented from reaching the gripping mechanism of the machine, when such mechanism is not in position to receive them, and the introduction into the running parts of the machine of sheets which are uncontrolled owing to the breakage of the web, by tension or otherwise, or owing to other causes, is avoided, while the carriage which carries the tape rollers can be adjusted without seriously altering the tension in the interrupted tapes. The tripping device is provided with a suitable handle or the like by which it can be operated, and this can be interlocked with a handle or the like which operates the adjustable nipping roller, the interlocking being of such type that the release of the nip on the web and the introduction of the sheet tripping device can be effected simultaneously, while the return of the nipping roller to its normal position, and the removal of the sheet tripping device from the path of the sheets, can be effected individually in the order required.

It will be seen that the interlocking of operating handles may be extended to other parts of all-size printing machines, so as to interrupt the travel of the paper simultaneously at different parts of the machine, and return the several feeding devices to their normal position in the correct order, and may also be extended to other necessary occasional mechanical movements connected with the working of the machine, such as the trip motion for parting the cylinders in a machine of lithographic type or the like.

The accompanying drawing shows an elevation partly in diagram and partly in detail of a portion of an all-size web printing machine constructed in accordance with one form of the invention.

The reel of paper *a* or the like is suitably mounted in the framework of the machine. The paper is unreeled from the reel *a* in the direction of the arrows passing under a spring tension roller *b* carried in journals *c* which rises and falls in the usual manner during the unreeling of the web, and keeps the web taut. From this point the web passes over a guiding roller *d*, and partially around the roller *e*, which forms one of the pair of nipping rollers and is carried in fixed journals in the framework.

The roller *f* forms the other of the pair of nipping rollers, and is in gearing contact with roller *e*, and constrained to rotate at the proper speed by a chain of gearing (not shown) deriving its motion from one of the principal running parts of the machine.

The roller *f* is carried in eccentric journals *g* mounted in the framework of the machine.

The journals *g* are coupled by suitable

pins or otherwise to the rods *h*, the other ends of which rods are adjustable and pass through swivels *k* which turn in the levers *l*, which are securely mounted upon a shaft *m* to which is also fixed a handle *n*.

It will be seen from the drawing that the operation of the handle *n* in a clockwise direction will release the nip of the nipping rollers *f* and *e* as and when required.

From the nipping rollers *e*, *f*, the web passes forward between two knives *o*, *p*, which may be of the type described in English Patent No. 8467 of 1914 and is passed forward over the roller *q* by any suitable means until the front edge of the cut web reaches a point approximately on the line of centers of the rollers *r* and *s*. At this moment a second cut takes place, and the sheet so cut is taken charge of by the two sets of continuous tapes or strings as described immediately below.

The first of these sets which forms the lower set passes around the rollers *q*, *r*, *t*, *v*, *w*.

The second or upper set passes around the rollers *x*, *s*, *y*, *z*, 1, 2, 3, 4, 5, 6, 7, 8.

The rollers *s* and *r* are supported in a carriage (not shown) which is adjustable longitudinally to the direction of the sheets. These rollers are mounted in such a manner that the upper and lower tapes are pressed together between them. In the carriage carrying the rollers *s* and *r* there is mounted also a third roller 4 forming one of the rollers around which the upper tapes are passed. The object of this roller is to break the continuous line of the upper tapes between the rollers *s* and 4, and in this manner to form an intervening space for the curved sheet tripping device 9 which is mounted on a shaft 10, and to which is securely fastened a lever 11.

It will be noticed that the arrangement of the rollers carrying the upper tapes allows of the carriage carrying the rollers 4, *s*, *r*, being adjusted longitudinally without seriously altering the tension of these tapes, and also provides a space between the rollers 1, 6, *y*, *z*, which is utilized for gathering up any sheets which are tripped out by the sheet tripping device 9.

The sheet tripping device 9 is operated by a movement of the flat rod 12 which is jointed at one end to the lever 13 which turns freely in the framework and jointed at the other end to the bell crank lever 14 which is jointed to the connecting rod 15, the other end of which is jointed to the bell crank lever 16, which is again connected by means of the connecting rod 17 to the handle 18, freely mounted on the shaft *m*.

By operating the handle 18 in a clockwise direction, it will be seen that the flat rod 12 is lowered from the position shown

in the drawing and allows the lever 11 to fall, and the lower end of the sheet tripping device 9 to fall below the line of the lower tapes, and so intercept any sheets which may be running toward the machine, and divert them in the direction of the two portions of the upper tapes which run between the rollers 5, 6, and *s*, *y*, respectively.

In the drawing there is shown a third handle 19, also freely mounted on the shaft *m* which by movement in a clockwise direction operates a motion (not shown) so as to remove from printing contact the cylinders 20, 21.

The pin 22 in the handle 18 and the pin 23 in the handle *n*, operate in one direction against the lower extremities of the handles 19 and 18, respectively.

It will now be seen that the operation of the handle *n*, in a clockwise direction, will operate also simultaneously the handles 18 and 19, and in this manner the pressure of the nipping rollers *e*, *f*, will be removed, and the unreeling of the web from the reel *a* will be stopped and any sheet which is then cut by the knives *o*, *p*, will be removed from its course to the cylinders 20, 21, by the sheet tripping device 9, and received in the space between the rollers 1, 6, *y*, *z*, while at the same time the cylinders 20, 21, are removed from printing contact as is required in some methods of printing, and advisable in all methods of printing when there is no sheet to receive the impression.

It will also be seen that the resumption of the normal printing conditions of the machine is obtained by the independent operation in a contra-clockwise direction of the three handles *n*, and 18 and 19, in that order.

By this means the pressure of the nipping rollers *e*, *f*, is again applied to the web and after the first sheet has been disposed of by the sheet tripping device 9, this device resumes its normal position, and after the sheets begin to reach the cylinders 20, 21, these cylinders are replaced in printing contact.

In the case of breakage, of the web between the reel *a* and the nipping rollers *e*, *f*, or in the case of the reel *a* being completely unreeling, the spring tension roller *b* will be released and will fall from its normal suspended position, which is considerably above the position indicated in the drawing, and the freely swinging piece 24 which is pivoted on the sliding journal *c*, and hangs vertically when the roller *b* is suspended, will strike the indicated portion of the catch 25, lifting this catch and releasing the lever 26 which normally restrains the spring operated forked rod 27, and in this manner operating the pin 22 and the handles 18 and 19, so as to operate the sheet tripping device 9, and remove the cylinders 20 and 21 from printing contact.

Having now described my invention, what I claim as new and desire to secure by Letters Patent is:—

1. In all-size web printing machinery, means for cutting the sheet from the web, a pair of adjustable rollers adapted to press the tapes together to take charge of a cut sheet, a third roller adjustable with said pair of rollers, a sheet tripping device, tapes arranged so that the continuous line of one set of said tapes is broken in the neighborhood of said sheet tripping device, as set forth.

2. In a web printing machine, means for cutting the sheet from the web, printing rollers and means for conveying a sheet of paper to a printing roller, said means comprising a lower endless web, and an upper endless web formed of two portions whose inner ends are spaced apart and having a portion of said lower web bridging the space between the said portions.

3. In a web printing machine, means for cutting the sheet from the web, printing rollers, nipping rollers, one of which is movable with respect to the other, upper and lower endless webs for conveying a sheet of paper to the printing rollers, the upper web having two portions whose inner ends are spaced apart, a sheet tripping device normally extending between the portions of the said upper web, and means for simultaneously operating the tripping device and the movable nipping roller to release the sheet of paper.

4. In a web printing machine, means for cutting the sheet from the web, a tripping device, a tension device for the paper to be printed upon, having a movable member, a pivoted catch, with which the movable member of the tension device is adapted to engage, a spring pressed member, a lever engaging the catch and holding the spring pressed member against the action of its spring, and means operated by the spring pressed member for operating the tripping device.

5. In a web printing machine, means for cutting the sheet from the web, printing rollers, a lever for moving the printing rollers out of contact, nipping rollers one of which is movable with respect to the other, a lever means for operating the movable nipping rollers to release the sheet from the rollers, a sheet tripping device, a lever means for operating the tripping device from the last named lever, and means whereby all the levers may be operated by operating the lever which operates the nipping roller.

6. In web printing machinery in combination, nipping rollers one of which is adjustable, means for removing the nipping rollers from the web, without interrupting the continuous running of the machine, means for tripping the sheet when the nip of the web

is released, interlocking handles adapted to operate the adjustable web nipping roller and the sheet tripping devices simultaneously in one direction, and individually in the order required in the other direction, as set forth.

In testimony whereof I have signed my

name to this specification in the presence of two subscribing witnesses.

ARTHUR BURROUGHS EVANS.

Witnesses:

L. CROWDER,
J. SANDERSON.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."