

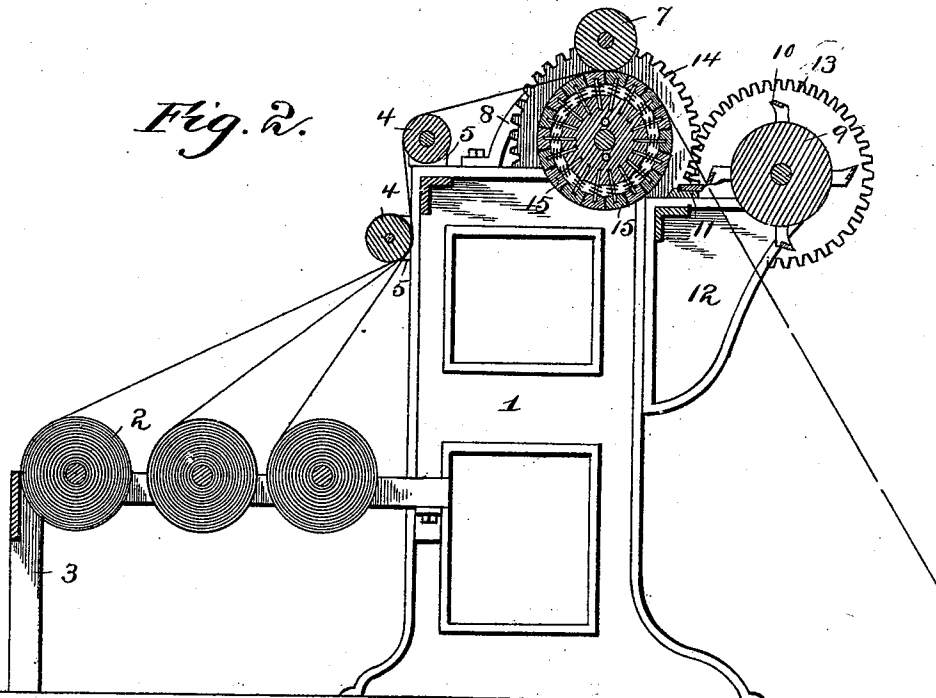
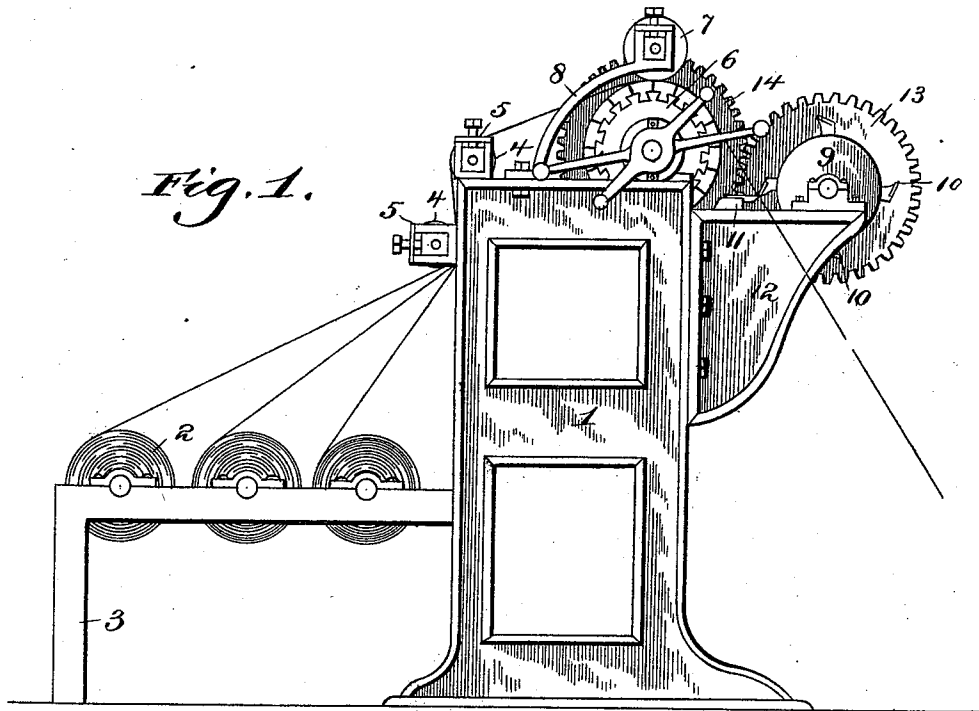
(No Model.)

3 Sheets—Sheet 1.

J. SPENCER.
PAPER CUTTING MACHINE.

No. 519,075.

Patented May 1, 1894.



Witnesses:
J. M. Giv.
M. L. Moran.

Inventor:
Joseph Spencer.
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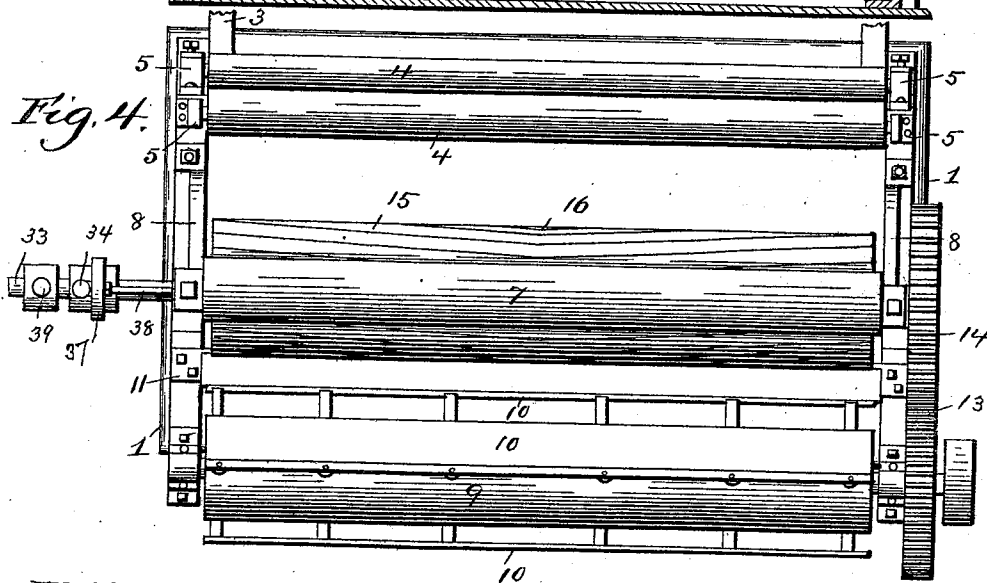
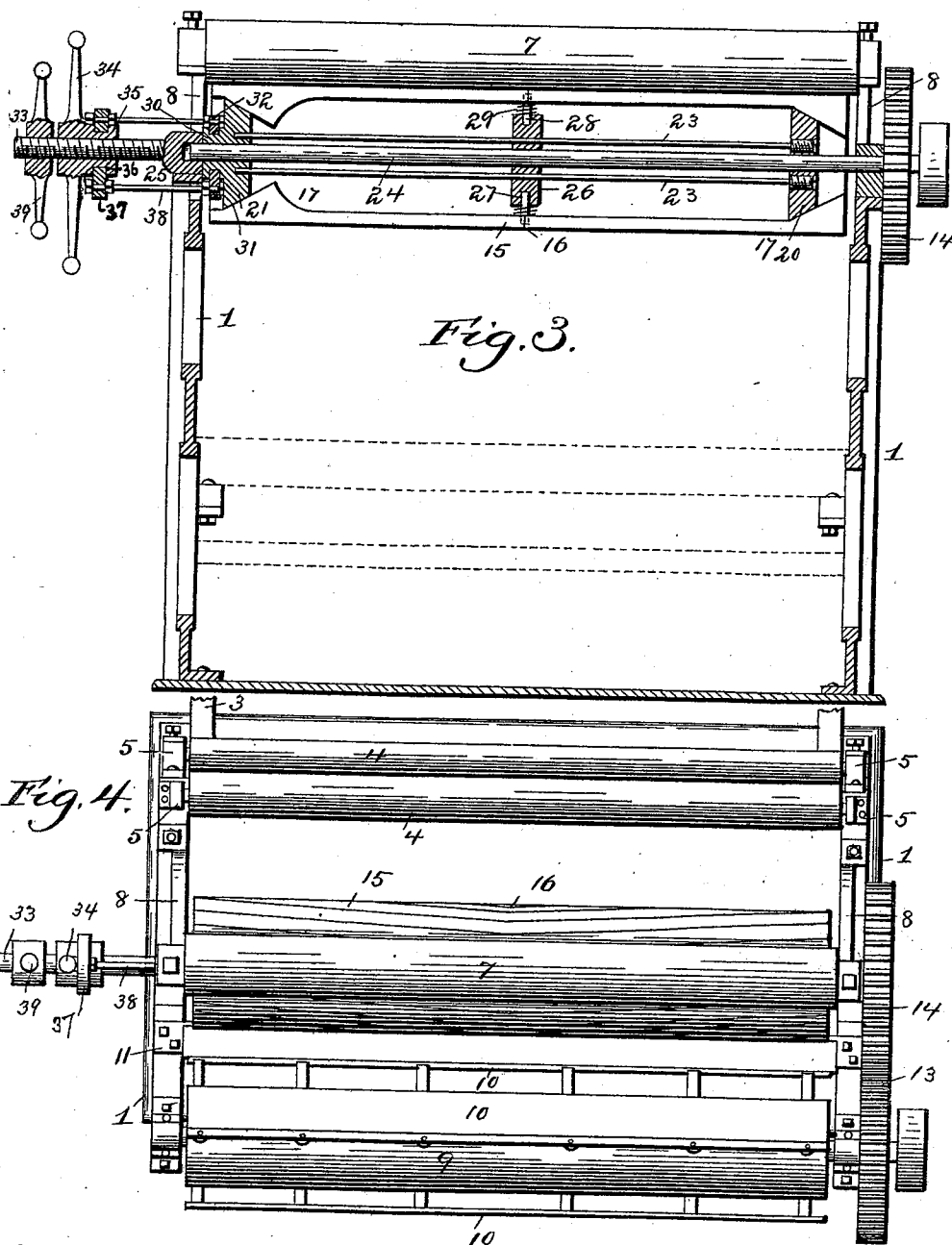
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J. SPENCER.
PAPER CUTTING MACHINE.

No. 519,075.

Patented May 1, 1894.



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(No Model.)

3 Sheets—Sheet 3.

J. SPENCER.
PAPER CUTTING MACHINE.

No. 519,075.

Patented May 1, 1894.

Fig. 5.

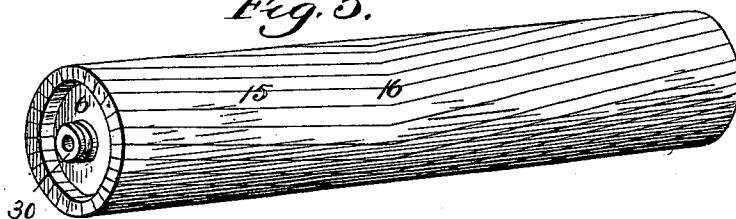


Fig. 6.

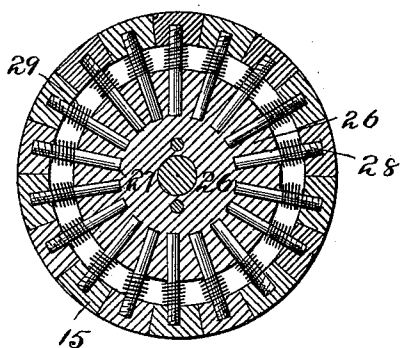


Fig. 7.

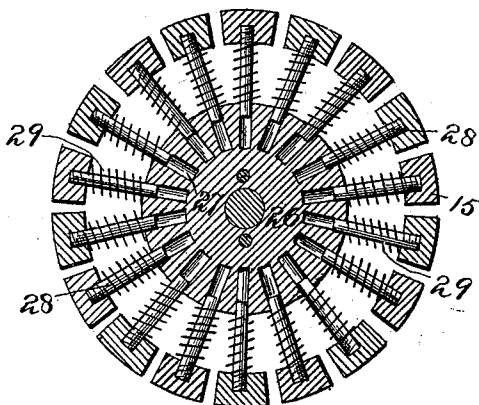


Fig. 8.

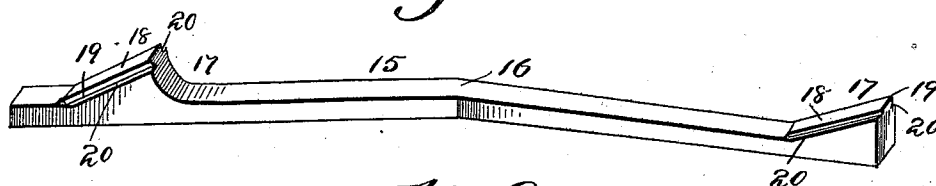
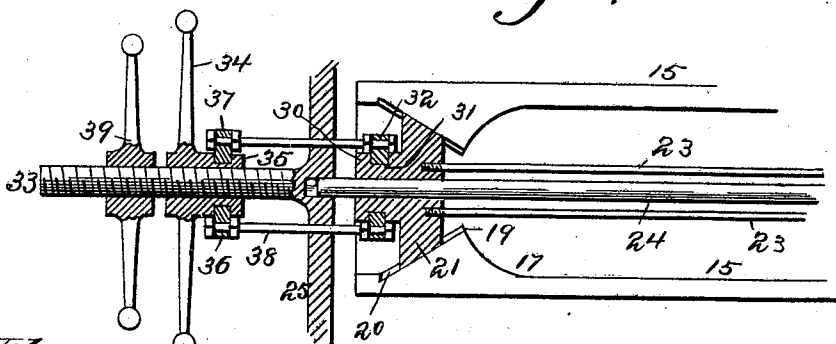


Fig. 9.



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UNITED STATES PATENT OFFICE.

JOSEPH SPENCER, OF CORNWALL, CANADA.

PAPER-CUTTING MACHINE.

SPECIFICATION forming part of Letters Patent No. 519,075, dated May 1, 1894.

Application filed May 25, 1893. Serial No. 475,460. (No model.)

To all whom it may concern:

Be it known that I, JOSEPH SPENCER, a citizen of the United States of America, residing at Cornwall, in the Province of Ontario and Dominion of Canada, have invented certain new and useful Improvements in Paper-Cutting Machines, of which the following is a specification, reference being had therein to the accompanying drawings.

My invention relates, in general, to paper-cutting machines for cutting sheets of paper into varying lengths according to requirements; and more particularly refers to new and improved means for varying the length of the cut while the machine is in operation.

Heretofore, in this art, it has been the practice to adjust the length of the cut by various regulable motion-transmitting devices, such as chain-gearing, cone-pulleys, friction-disks, &c., all of which are more or less objectionable in that no direct connection is established between the cutting mechanism and the feed-roll, and moreover, there is always more or less possibility of accidental slipping which interferes with the operation. Again, with some of these forms of connections, it is necessary to suspend operation to make the adjustment for a different length of cut. Accordingly, my improvement contemplates the provision of means so that by decreasing or increasing the diameter of an expansible feed-roll more or less paper can be fed to the cross-cut knife in the interim elapsing between the last cut and the next succeeding one, thereby cutting from an endless web of paper into the required sheets of various lengths without interfering with the continuous operation of the machine. Owing to the fact that the feed-roll itself is variable in diameter under the control of the operator to feed the necessary length of cut, the cross-cut knife and the said feed-roll can be directly connected by inflexible and invariable gearing, thus precluding any possibility of slip between the two. By my invention, the difficulty which has been experienced in cutting paper to "water-mark" is entirely obviated. In utilizing machines for this latter purpose having changeable or variable gearing, such as are present on lathes, it is almost impossible to obtain the exact length of cut required. The usual result is that the sheet is a little long or a little short.

In like manner, where the knife and feed are connected by chain or sprocket gearing, it is very difficult to adjust the latter while the machine is in motion; and in cutting to "water-mark" this type of machine is impracticable.

My invention has for its further object to provide a machine of this class which will be simple in construction, inexpensive in manufacture, durable in use, and eminently serviceable and efficient in operation.

For the attainment of these objects, and for other purposes hereinafter enumerated, this improvement comprises, in brief, certain details of construction, and organization of apparatus, all of which will be more fully described hereinafter.

The novel features of the invention are embraced in the appended claims which are intended to accord in their scope and meaning with the prior state of the art and the existing law.

Referring to the accompanying drawings forming a part of this specification:—Figure 1 is a side view of a machine embodying my invention. Fig. 2 is a central longitudinal section of Fig. 1. Fig. 3 is a transverse section of Fig. 2, taken centrally through the feed-roll. Fig. 4 is a top-plan view of Figs. 1 and 2. Fig. 5 is a detail perspective view of the expansible feed-roll, shown detached from the machine and from its supporting shaft. Fig. 6 is a transverse central section, enlarged, of the expansible feed-roll, showing the same in its most contracted position. Fig. 7 is a similar view, showing the same expanded to the utmost. Fig. 8 is a detail perspective view of one of the series of staves which compose the periphery or surface of the roll. Fig. 9 is a detail enlarged view, with parts broken away, showing the regulating or adjusting mechanism whereby the feed-roll is expanded or contracted by the operator.

In all of the views of the drawings, like numerals of reference denote like or corresponding parts.

Referring to Figs. 1 and 2, 1, is the framework of the machine, of any approved or desired construction to hold and accommodate the incumbent and operating parts.

2, are the supply-rolls mounted in suitable bearings on an extension, 3, of the frame.

4, are tension rolls, journaled in adjustable spring-pressed bearings, 5, and serving to guide and take up slack in the paper fed from the supply-rolls.

5 6, is the feed-roll.

7 is the tension-roll coacting with the feed-roll and located above the same in journals carried by the bracket-arm, 8, of the frame; and 9 is the cutting-roll carrying the cutting
10 knives, 10, co-operating with the stationary bed-knife removably seated in a bed-plate, 11, fitted to the forward bracket-frame, 12. Motion is given the cutting roll in any desired manner from any suitable power source,
15 not shown, and the cutting-roll is directly connected with the feed-roll by a king-gear, 13, on the cutting-roll intermeshing with the similar gear, 14, on the feed-roll. The feed-roll, 6, is made up of a series of radially movable
20 integral staves, 15, forming the periphery or surface thereof, and each provided centrally with an angular knee or bend, 16, whereby the interval or space between any two staves will not be in an axial plane of the roll, and
25 will thereby prevent the paper from being creased or forced into the crevices between the staves. At each end of a staff is formed a depending triangular projection, 17, extending downward from the under side there-
30 of and having an inclined straight face, 18, provided with an integral dovetailed inclined tongue or rib, 19 formed by two undercut recesses, 20, one on each side of the rib or tongue. By means of this dovetailed tongue
35 or rib of each extremity of a staff a splined or dovetailed movable connection is made with the cylinder-heads, as hereinafter explained. The staves are supported at each
40 end by the cylinder heads, 21, one at each end of the feed-roll. Each head, 21 is in the form of a solid metal drum having an inwardly beveled or chamfered tread or periphery provided at intervals there-around with undercut recesses, spaced equal distances
45 apart, and coincident severally with the tongues or ribs, 19, one of each of which is designed to be seated and held slidably in an opposite recess, 22. Thus, by this construction, it will be clear that by moving the heads, 21, in unison in either direction, the staves
50 will be radially expanded or contracted accordingly, owing to the dovetailed connection and the corresponding inclinations of the tongues and the treads of the cylinder-heads. These two cylinder-heads are rigidly connected
55 together for joint movement by the longitudinal tie-rods, 23, screwed at each end into the body of an adjacent head; and the said heads are severally splined on the central
60 shaft, 24, which is journaled at each extremity in suitable bearings, 25, of the frame. Midway the shaft, 24, is rigidly keyed the cross-head 26 having around its outer tread or periphery a series of radially-extending
65 guide-holes, 27, in which work the limiting pins, 28, severally secured at their outer ends to the centers of the staves. Between the

cross-head and each staff is interposed an expansion-spring, 29, coiled around the limiting pin of that particular staff and tending to keep the staves away from the cross-head. By means of this latter construction, the staves are prevented from any lengthwise movement when they are outwardly or
70 radially expanded. 75

On the operating side of the machine, one of the heads, 21, is provided with a laterally projecting integral boss, 30, having an annular recess, 31, encircling the same exteriorly, and forming a seat for the collar, 32, which
80 is or may be loosely fitted therein. On the journal bearing adjacent to this particular head is formed an outwardly projecting integral screw-stem, 33, upon which works the regulating hand-wheel, 34, the hub of which
85 is interiorly screw-threaded to engage the stem, 33, and is further provided with an extension-boss 35 provided with an outer annular recess, 36, in which is seated the annular collar, 37, connected by the tie-rods, 38,
90 with the collar, 32, on the head 21. By this arrangement the operator can slide the heads, 21, back and forth on the spline of the shaft to contract or expand the staves, at will.

On the end of the stem, 33, is screwed the
95 jam or clamp-nut, 39, which can be used by the operator to lock the hand-wheel, and consequently the heads, 21, in any desired position.

In operation, the operator can, by expand-
100 ing the staves, or contracting them, increase or decrease the diameter of the feed-cylinder, and thereby vary the length of the cut of the sheet.

In regard to the arrangement and opera-
105 tion of the supply-rolls, the tension rolls, the cutting-rolls, and the cutting knives, together with other concomitant apparatus, no special description is necessary since they form no component part of the invention, and may
110 be of any approved construction or arrangement.

Various changes as to form, proportion, material, and details of construction of the subject-matter of my invention may be had
115 without the exercise of invention, and therefore, without departure from the spirit of the invention.

Having thus fully described my invention, what I claim, and desire to secure by Letters
120 Patent, is—

1. In a paper cutting machine, the combination with paper cutting mechanism, of an expansible feed roll forming a part of the feeding mechanism and comprising a series
125 of radially movable staves, each provided with a knee or bend, and means, substantially as described, for moving and controlling said staves.

2. In a paper cutting machine, the expan-
130 sible feed roll composed of a series of closely arranged radially movable staves having lateral bends between their ends deflected in the same direction so that the bends of the

staves fit into each other or interlock for the purpose set forth, and sliding heads for controlling said staves.

3. In a paper cutting machine, the combination of cutting mechanism, the expansible feed roll composed of radially movable staves, an axial shaft journaled in the frame of the machine, guides for the staves, the connected sliding heads on the shaft controlling and moving the staves, the outer head having a grooved hub, a loose ring in the hub, a screw

bolt rigid with the frame, and a nut thereon having a loose ring confined thereon and connected with said first mentioned ring for the purpose described.

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

JOSEPH SPENCER.

Witnesses:

N. H. McINTOSH,
S. I. GOGO.