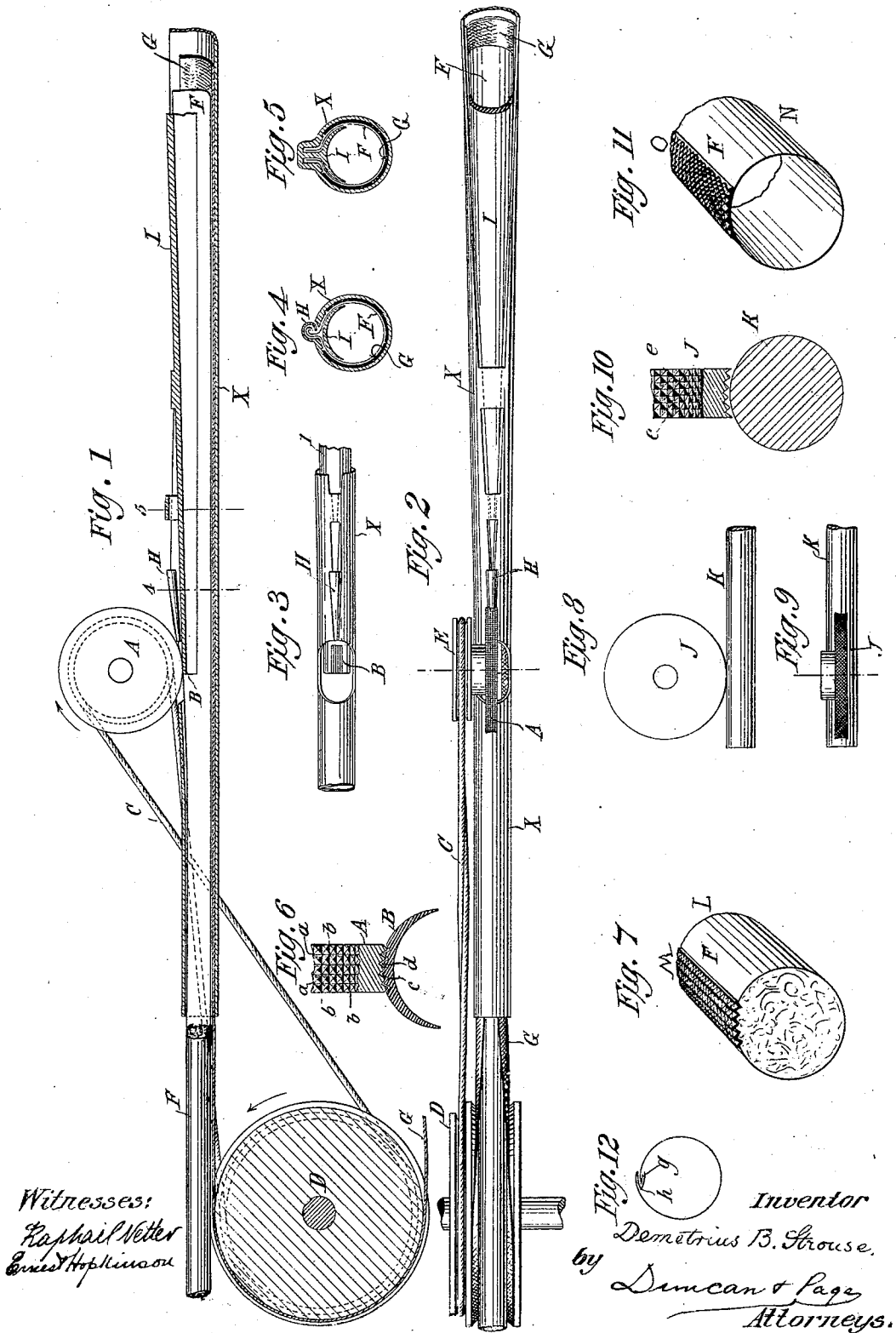


(No Model.)

D. B. STROUSE.
MACHINE FOR SECURING SEAMS OF PAPER TUBES.

No. 554,095.

Patented Feb. 4, 1896.



UNITED STATES PATENT OFFICE.

DEMETRIUS B. STROUSE, OF SALEM, VIRGINIA, ASSIGNOR TO THE BONSACK MACHINE COMPANY, OF SAME PLACE.

MACHINE FOR SECURING SEAMS OF PAPER TUBES.

SPECIFICATION forming part of Letters Patent No. 554,095, dated February 4, 1896.

Application filed October 31, 1893. Serial No. 489,600. (No model.)

To all whom it may concern:

Be it known that I, DEMETRIUS B. STROUSE, of Salem, in the county of Roanoke and State of Virginia, have invented certain new and useful Improvements in Machines for Securing the Seams of Paper Tubes Especially Designed and Adapted for Cigarette-Wrappers; and I do hereby declare that the following is a full, clear, and exact description of the same.

10 The invention relates to crimping-wheels for securing the opposite edges of a strip or piece of paper into a seam when such edges have been brought into engagement with each other; and the invention consists in forming the periphery or operative edge surface of the wheel into fine points or teeth by means of line depressions running in two directions across such edge surface and preferably at right angles to each other; also in the combination of a crimping-wheel whose edge surface is provided with points or teeth formed by line depressions running circumferentially around the edge surface and line depressions running parallel with the axis of the wheel across such surface, and a mandrel provided with depressions and projections so arranged relatively to the depressions and projections on the wheel-surface that the points or projections of the latter will run in the indentations or grooves of the former, and vice versa, whereby the several thicknesses of the paper are secured into a seam by indentations made in its opposite sides, and but little obstruction is offered to the advance of the paper through the crimping device.

15 The invention is specially adapted to securing the seam of a cigarette-wrapper of thin paper, whether the said wrapper is provided with a tobacco-filler before its opposite edges are brought together and secured into seam or is first formed into a completed tubular wrapper, which is then filled with the necessary quantity of tobacco.

20 Heretofore crimping-wheels provided with alternate line indentations and projections running across their edge surfaces in one direction have been used to crimp the opposite engaged edges of a cigarette-wrapper into a completed seam; but where such wheels are used in connection with a stationary mandrel arranged upon the opposite side of the seam to resist the pressure of the crimping-wheel

it is found that there is a drag of the paper upon the mandrel, which is liable to rupture and tear it, even when the surface of the mandrel is made smooth, and this is especially the case when the mandrel is provided with cross indentations and projections to mesh with those of the wheel.

25 It is the object of my invention to remedy this difficulty, and also to provide such indenting contact between the crimping-wheel and the paper as will overcome, or assist to overcome, the frictional contact between the paper and the mandrel due to the pressing of the paper upon the mandrel, whether the contact-surface of the mandrel is smooth or is provided with indentations and projections, as hereinafter described.

My invention is illustrated in the accompanying drawings, in which—

30 Figure 1 is a view of a crimping-wheel mounted to operate in connection with a mandrel and showing also means for feeding the tobacco-filler and the wrapping-strip of paper and for bringing the edges of the strip together into a seam. Fig. 2 is a plan view of the same. Fig. 3 is an enlarged view of a portion of the feeding and wrapping devices and the mandrel, showing longitudinal depressions and projections at the end of the mandrel. Figs. 4 and 5 are cross-sections on the lines 4 and 5, respectively, of Fig. 1. Fig. 6 is an enlarged view of the crimping-wheel and mandrel of Figs. 1 and 2, the wheel being partly in section and partly in elevation. Fig. 7 is an enlarged view, in perspective, of a section of a cigarette whose seam is secured by the devices shown in Fig. 6. Figs. 8, 9, and 10 are views in elevation, plan, and section, respectively, of a crimping-wheel whose edge surface is corrugated by diagonal cross-lines, as shown in Fig. 9, and arranged to operate in connection with a smooth-surfaced mandrel. Fig. 11 is an enlarged view, in perspective, of a cigarette-wrapper whose seam is secured by construction shown in Figs. 8, 9, and 10; and Fig. 12, in cross-section, a strip of paper with its edges folded or lapped and its opposite edges brought into engagement for a seam of a cigarette-wrapper.

35 In the drawings, A represents a crimping-wheel whose peripheral or operative edge surface is formed into points or projections by

depressions *a* running around such surface and depressions *b* running across such surface and at right angles to the depressions *a*. This wheel for operation is located above a mandrel B which is provided with indentations *c* and projections *d* whose direction is the same as that of the depressions *a* on the wheel. The indented lines upon the surface of the wheel are quite close together—preferably, for cigarette work, from fifty to seventy to the inch—so that the surface will be formed into a large number of very fine points or teeth.

The wheel A is arranged in relation to the mandrel B, as shown in Figs. 1, 2, and 6, and is supported in any suitable way and driven by any suitable means, preferably by a band C passing over a driven pulley D and a pulley E on the shaft of wheel A. The opposite edges of a strip of paper F suitable for a cigarette-wrapper are brought into proper engagement with each other to form an incomplete seam which is passed between the periphery of wheel A and the mandrel B, where it is formed into a completed seam by crimping the several layers of paper together.

The above-described crimping-wheel A is adapted for securing the seam of a cigarette-wrapper when the tobacco-filler is present or when it is absent. In the former case a construction like that shown in Figs. 1, 2, 3, 4, and 5 may be used, in which X is a tubular construction, through which runs a belt G, on which is superimposed the continuous strip of paper F of sufficient width to be wrapped around a filler of tobacco and form an incomplete seam by bringing its opposite edges together. The tobacco-filler is formed by any desirable means and fed onto the wrapper-strip while it is in an open condition to receive it. The paper strip is wrapped around the filler and its edges are brought into engagement with each other in any proper way to form an incomplete seam, as by a folder H, which brings them into position, as shown in Fig. 4. In this construction the free end of a tongue I forms the mandrel B, the tongue being attached to the tube X in the rear of the engagement of the opposite edges of the paper strip with each other. As the wrapper-strip F carrying the tobacco-filler is advanced through the tubular device X it is gradually folded or wrapped around the filler, its opposite edges being brought together into an incomplete seam and then passed between the periphery of the wheel A and the mandrel B, by which the various thicknesses of paper forming the incomplete seam are indented and incorporated together and a continuous cigarette is produced which can be cut into desirable lengths by any devices adapted for this purpose.

Fig. 7 shows in perspective a section of a completed cigarette L, whose seam M is secured by passing between the wheel A and the mandrel B.

The above-described construction may also

be employed in the manufacture of tubes, which may be cut up into proper lengths for individual cigarette-wrappers and then stuffed with the proper quantity of tobacco by hand or otherwise.

The crimping-wheel J shown in Figs. 9 and 10 may be regarded as a modification of that shown in Figs. 2 and 6, in this respect that while its operative surface is formed into a large number of fine points or teeth the rows of teeth run diagonally across such surface and are not parallel with the axis of the wheel or at right angles thereto. It follows that this wheel is not well adapted for use in connection with a mandrel provided with points or projections, but only in connection with a smooth surface. It may, however, be used to make a continuous completed cigarette by making the mandrel B smooth instead of corrugated, as shown in Fig. 3; or it may be used in connection with a solid smooth mandrel K, as shown in Figs. 9 and 10, such mandrel being used in connection with suitable guides for directing the paper strip and bringing its opposite edges into engagement, substantially as shown in Figs. 3, 4, and 5, and with means for advancing the same, which latter may be the belt G or other means.

Fig. 11 shows a section of a completed tube N, whose seam O is secured by the wheel J, operated in connection with a smooth mandrel located inside of the seam.

Instead of bringing the opposite edges of the wrapper-strip together and then rolling or folding the two edges upon each other, in order to give a proper engagement of the edges for the incomplete seam, as shown in Fig. 4, one of the edges may be folded into a single fold or lap *g*, Fig. 12, and the other edge into a double fold or lap *h*, and then, when the strip has been brought into tubular shape, the single fold may be inserted between or into the double fold, as shown in Fig. 12, and the seam thus formed be secured by passing between the crimping-wheel and the mandrel.

The advantage of crimping-wheels whose operative surface is provided with fine teeth or points, as above described and shown, is twofold: First, they operate to produce a large number of indentations in the several thicknesses of paper which make up the seam, and thereby intimately incorporate them together to form a strong and reliable seam to resist the expansion of the tobacco; and, second, they operate to feed the paper strip uniformly through the crimping device by the frictional contact of the numerous indenting points or teeth with the paper strip, whereby the strip is slightly lifted from the mandrel and its frictional drag thereon is lessened.

What is claimed as new is—

1. In a device for securing the opposite edges of a strip of paper, when brought into engagement with each other, into a completed seam to form a tube, the combination, sub-

stantially as described and shown, of a wheel having its peripheral surface formed into points or teeth by line indentations or depressions crossing each other, and a mandrel, these parts being so arranged relatively to each other that, as the several layers of paper constituting the seam are pressed between the wheel and mandrel they will be indented and incorporated together.

- 10 2. In a device for securing the opposite edges of a strip of paper, when brought into engagement with each other, into a seam to form a tube, a wheel having its peripheral

surface provided with points or teeth arranged in rows running across the face of the wheel and parallel to its axis and in rows running around the periphery of the wheel and at right angles to the cross rows, in combination with a mandrel provided with depressions and projections to match corresponding parts on the wheel, substantially as and for the purpose set forth.

DEMETRIUS B. STROUSE.

Witnesses:

S. D. McCOMMON,
M. C. GARST.