(No Model.) 2 Sheets—Sheet 1.

A. J. BOYNTON.

TUBING AND PRINTING PAPER BAGS.

No. 301,084. Patented July 1, 1884.

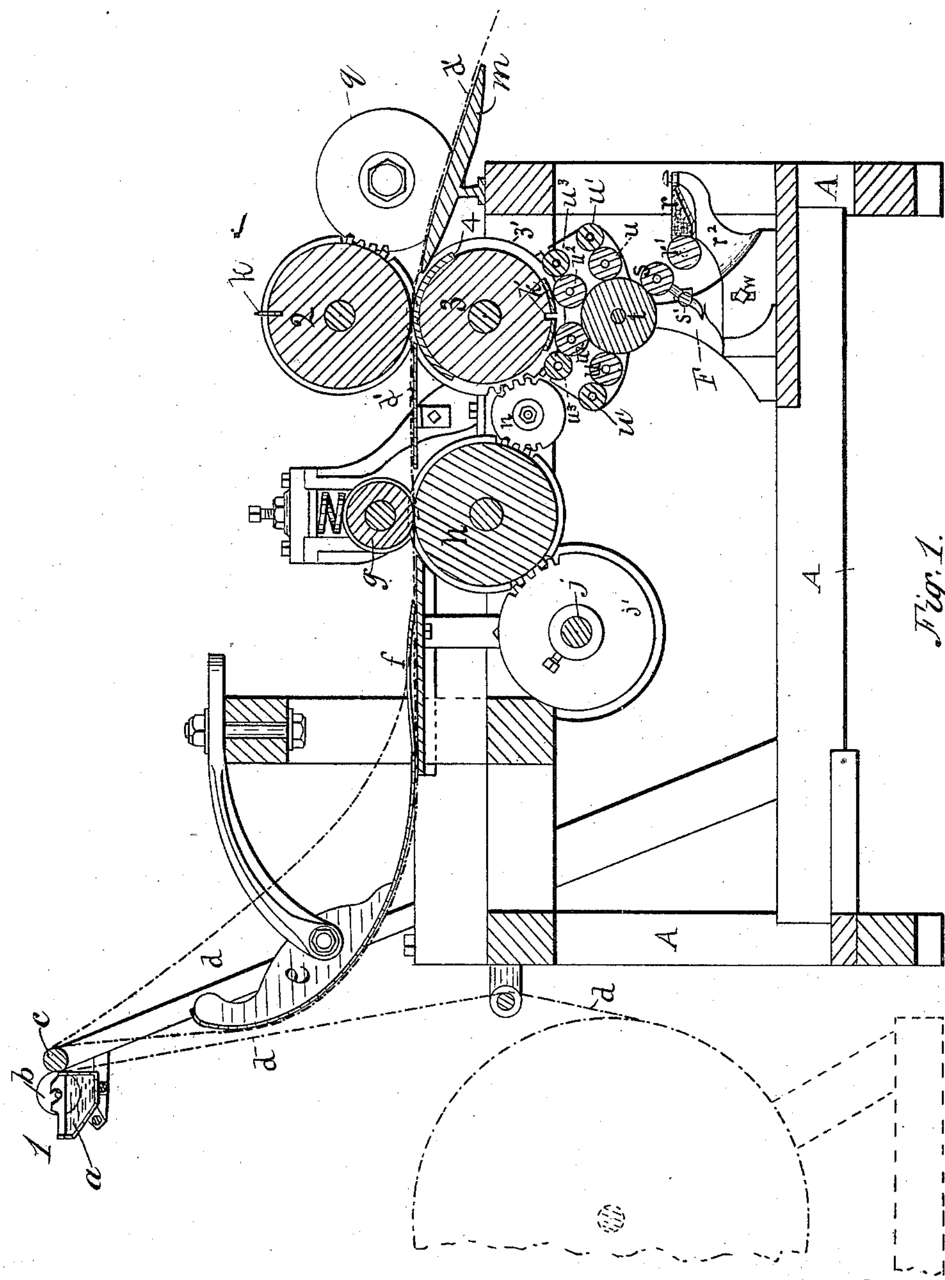

Fig. 1.

Witnesses:
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G. B. Maynadier

Inventor:
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by Chas. F. Sleeper. Atty.

N. PETERS. Photo-Lithographer. Washington, D. C.

(No Model.) 2 Sheets—Sheet 2.

A. J. BOYNTON.

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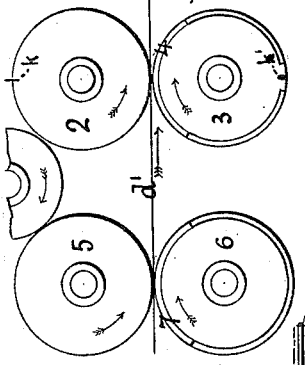

Fig. 4.

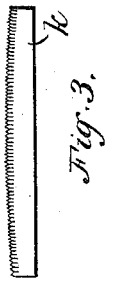

Fig. 3.

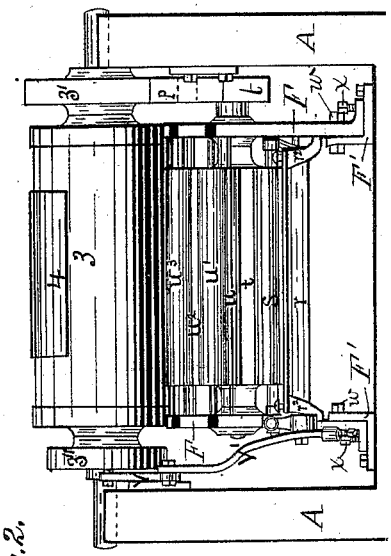

Fig. 6.

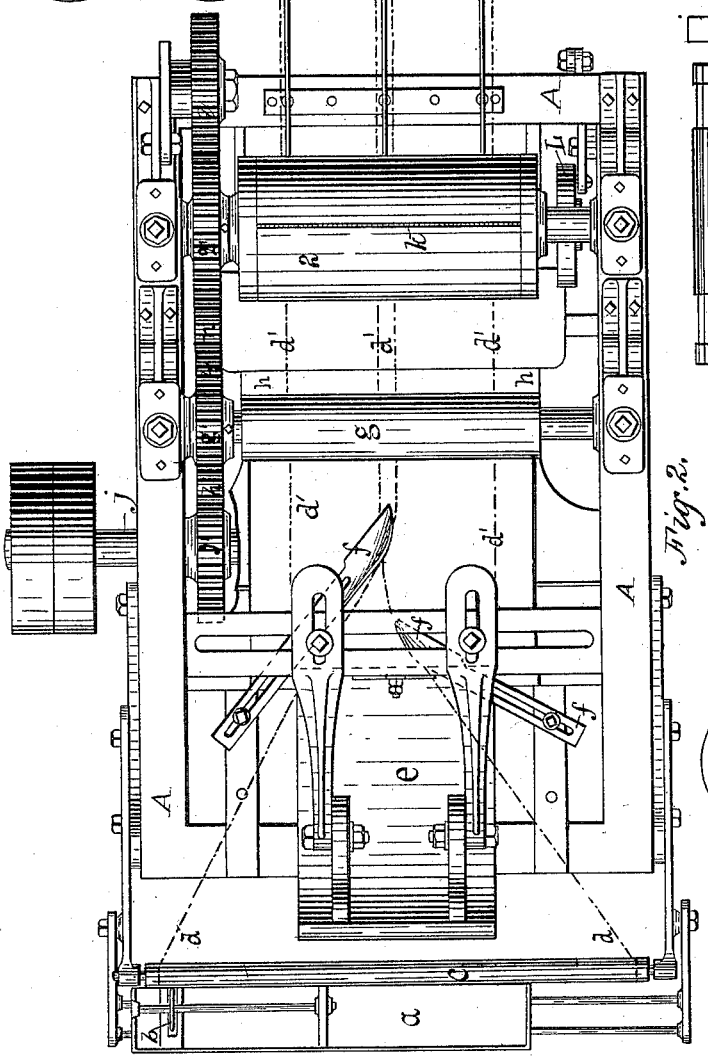

Fig. 2.

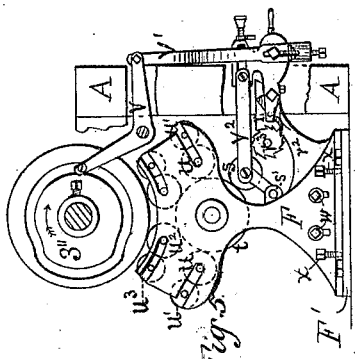

Fig. 5.

Witnesses:
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UNITED STATES PATENT OFFICE.

ANDREW J. BOYNTON, OF MALDEN, MASSACHUSETTS.

TUBING AND PRINTING PAPER BAGS.

SPECIFICATION forming part of Letters Patent No. 301,084, dated July 1, 1884.

Application filed July 27, 1883. (No model.)

To all whom it may concern:

Be it known that I, ANDREW J. BOYNTON, a citizen of the United States, residing at Malden, in the county of Middlesex and State of Massachusetts, have invented a new and useful Improvement in Tubing and Printing Paper Bags, of which the following is a specification.

My invention relates to improvements in machinery for tubing and printing paper bags, and combines the processes of taking the web from a roll, pasting one edge of the web, folding and pressing it into a flattened tubular form, then printing one side of the tube and afterward cutting off a proper length for a bag, leaving the part so cut off a pasted, folded, and printed tube ready for bottoming, these several operations being performed successively and continuously upon one and the same machine.

In the drawings, Figure 1 shows a longitudinal section of my machine; Fig. 2, a plan; Fig. 3, a view of the knife; Fig. 4, an arrangement of the cylinders for printing two colors, and Figs. 5 and 6 details of the inking mechanism.

A represents the frame of my machine. Power applied to the driving-shaft *j* is communicated by gears to the other portions of the machine, *j'* being the gear on the driving-shaft *j*, *h'* the gear on roll *h*, *g'* the gear on roll *g*, *n* an intermediate gear between the roll *h* and cylinder 3, 3' the gear on cylinder 3, 2' the gear on cylinder 2, *p* the intermediate gear between the cylinder 3 and the ink-roll *t*, and *t'* the gear upon the ink-roll. *q* is a drag-wheel geared to the cylinder 2.

The tubing mechanism I have shown is a well-known device for that purpose, *a* being a paste-trough; *b*, a wheel revolving in the paste and applying it to the edge of the web *d* as it passes over the roller *c*. The web *d* is folded into the form of tube *d'* as it passes under the former *e* and fingers *f f*, being drawn forward and pressed flat by the rolls *g h*, between which it passes. This completes the tubing, and as I make no claim to this mechanism more than to any other tubing mechanism, in this connection, I shall hereinafter refer to it by the figure 1 as a tuber. After the tube *d'* has left the tuber 1 it passes between two cylinders, 2 and 3. On the cylinder 2 is a knife, *k*, projecting from its surface, and adjusted to work in a groove, *k'*, in the cylinder 3. At each revolution of the cylinders 2 and 3 the knife *k* cuts off a portion of the tube of the proper length for a bag.

On the cylinder 3 I secure a form, 4, of type or other matters to be printed, curved to fit the periphery of the cylinder, which form is inked as the cylinder revolves, and then carried up and pressed against the paper tube as it passes between the cylinders 2 and 3, printing the tube, so that when it is cut off by the knife *k*, as before described, it is a complete printed tube, needing only the subsequent operation of folding and pasting the bottom to convert it into a complete printed bag ready for use.

When it is necessary to print two colors upon a bag, I insert between the tuber 1 and the printing and cutting-off cylinders 2 and 3 two other cylinders, 5 and 6, as shown in Fig. 4, the cylinder 6 having upon it a form, 7, which form prints one color upon the tube, while the other color is printed by the form 4, as before specified. Other cylinders may in a similar manner be introduced for printing other colors before the bag-length is cut from the tube. As the tube passes from the machine after it is printed and cut off it is received by the guides *m*, which are made to present their edges only to the tube to avoid friction and prevent blurring of the fresh ink. These guides are so arranged as to pass the bag clear of the machine to a suitable receptacle.

For properly inking the form I place beneath the cylinder 3 a frame, F F', to which are attached the inking devices. *r* is the fountain, and *r'* the fountain-roll, both supported by the bracket r^2. *s* is the vibrator-roll connected to a shaft, *s'*, on the frame F. *t* is the ink-roll, connected by gears *t' p* with the cylinder 3. *u u* are distributing-rolls, and *u' u'* are changers, usually of metal, automatically reciprocated longitudinally to break up the surface of the ink on the distributers *u*. u^2 are the form-rolls, which spread the ink upon the form. u^3 are riders, which by their weight serve the purpose of keeping the form-rolls in position, and also aid in breaking up the surface of the ink upon the form-rolls. The

riders and form-rolls are sometimes kept in position by springs bearing upon their journals. A cam-groove upon the wheel 3″, attached to the shaft of cylinder 3, operates, through a lever, *v*, connecting-rod *v'*, lever *v²*, and connecting-rod *v³*, to turn the fountain-roll a prescribed distance by means of the pawl and ratchet *r³*, and to move the vibrator-roll alternately into contact with the fountain-roll and the ink-roll, thus feeding the ink to the ink-roll. The base of the frame F F′ is made in two parts, as shown, the part F′ being rigidly attached to the frame A of the machine, while the part F can be raised or lowered by means of set-screws *x*, and fastened in position by means of set-screws *w*, in order to adjust the form-rolls to the surface of the form. As the cylinder 3 carries by its gears and cam the cylinder 2 and the inking apparatus, it develops what is called "backlash"—*i. e.*, the cylinder 3 will, if the gears are not exactly adjusted, turn more slowly than the cylinder 2, and prevent the proper action of the knife *k* in the groove *k'*. To regulate this action I have therefore applied a drag-wheel, *q*, to the gear on cylinder 2, which drag-wheel is mounted on a bracket attached to the frame A, and is independent of all other parts of the mechanism except that cylinder, which its weight retards sufficiently to allow the proper registration of the knife *k* in the groove *k'*.

I make no claim here to the inking mechanism shown in the drawings, and described in the specification, that being inserted to illustrate the operation of the printing portion of my invention, and it being my intention to make a separate application for Letters Patent thereon.

I do not claim, broadly, the device shown in the specification and drawings for preventing backlash, but as in combination with the mechanism set forth.

What I claim as my invention is—

1. The combination of a mechanism, substantially as described, 1, by which a web of paper is pasted, folded, and pressed flat, with two opposing revolving cylinders, 2 and 3, one of said cylinders having upon it a bent type-form, 4, impinging upon the periphery of the other cylinder, and one of said cylinders having a projecting knife, *k*, working in a groove, *k'*, in the other cylinder, the said cylinders receiving from the tubing mechanism a completed flattened tube, printing it, and cutting it into bag-lengths, substantially as described.

2. The combination, with the cutting-cylinders 2 and 3, of a drag-wheel, *q*, adapted to regulate the registering of the knife *k* and groove *k'* in the cutting-cylinders, substantially as described.

ANDREW J. BOYNTON.

Witnesses:
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