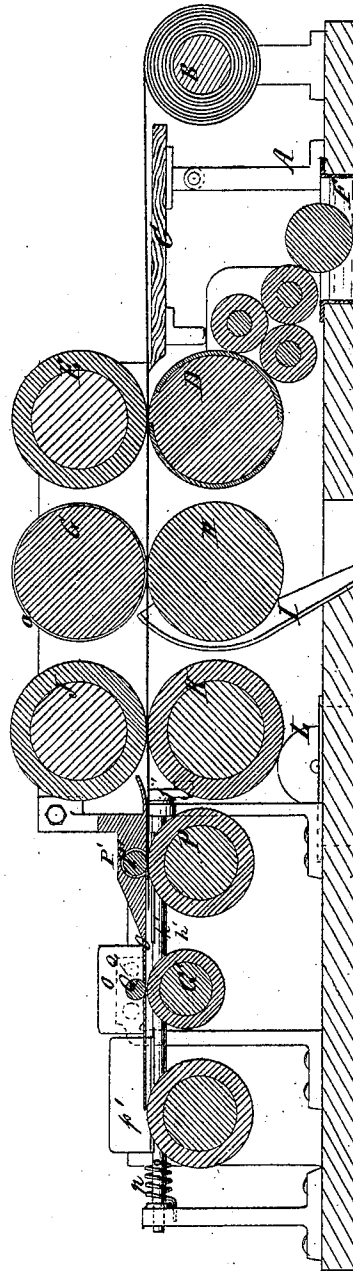


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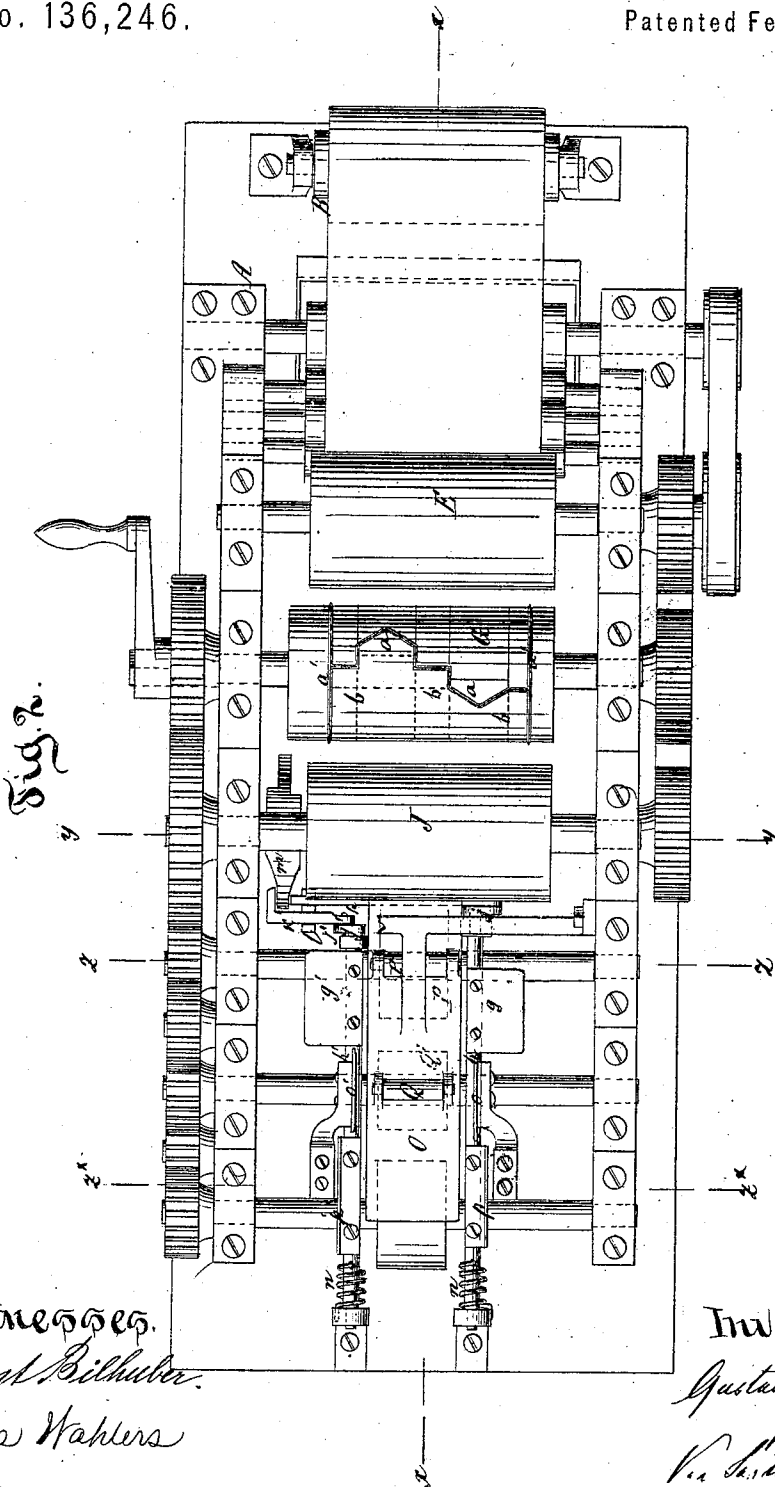
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Fig. 7.

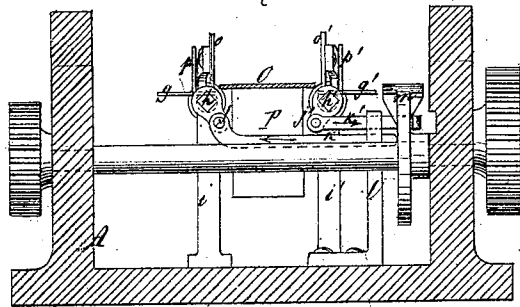


Fig. 8.

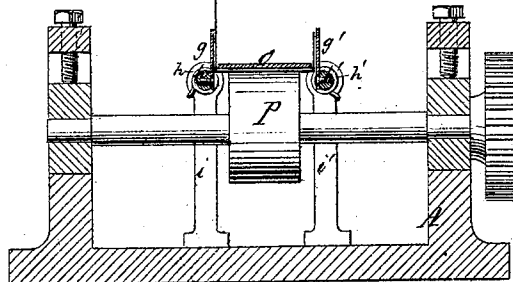


Fig. 11.



Fig. 12.



Fig. 9.

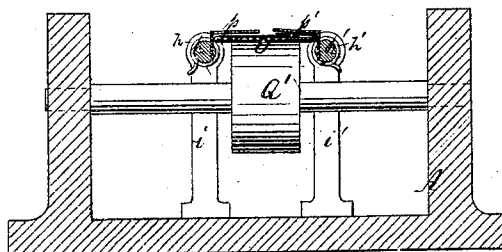
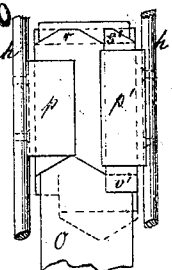


Fig. 10.



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# UNITED STATES PATENT OFFICE.

GUSTAV L. JAEGER, OF NEW YORK, N. Y.

## IMPROVEMENT IN MACHINES FOR MAKING PAPER BOXES.

Specification forming part of Letters Patent No. 136,246, dated February 25, 1873.

*To all whom it may concern:*

Be it known that I, GUSTAV L. JAEGER, of the city, county, and State of New York, have invented a new and Improved Machine for Making Paper Boxes; and I do hereby declare the following to be a full, clear, and exact description thereof, which will enable those skilled in the art to make and use the same, reference being had to the accompanying drawing forming part of this specification, in which drawing—

Figure 1 represents a longitudinal vertical section of this invention in the line  $x x$ , Fig. 2. Fig. 2 is a plan or top view of the same. Fig. 3 is a transverse section of the same in the plane  $y y$ , Fig. 2. Fig. 4 is a detached section of the parts shown in the previous figure taken in the plane  $y' y'$ . Fig. 5 is a detached elevation of the cutter-head. Fig. 6 is a plan of a blank cut out by my knife. Fig. 7 is a transverse section of my machine in the plane  $y y$ , Fig. 2, the rollers shown in Fig. 3 being omitted. Fig. 8 is a transverse section of the same in the plane  $z z$ , Fig. 2. Fig. 9 is a similar section of the same in the plane  $z^x z^x$ , Fig. 2. Fig. 10 is a plan of the blank, as folded by my invention. Fig. 11 is a bottom view of a box produced by my machine. Fig. 12 is a transverse section of the same.

Similar letters indicate corresponding parts.

This invention relates to a machine in which the pasteboard from which boxes are to be made is exposed successively to the action of printing-rollers, then to a cutter-head carrying knives for cutting out the blanks, and creasing devices which prepare the blanks for the folders; then to the action of pasting-rollers; and finally to the action of folding-flaps, in such a manner that the blanks are rapidly transformed into boxes, which, on being discharged from the machine, are readily completed simply by closing their ends.

In the drawing, the letter A designates a frame which forms bearings for the working parts of my machine. In one end of this frame is mounted the roller B, which contains the pasteboard from which the boxes are to be manufactured. From this roller the pasteboard is carried over a table, C, and made to pass between the type-roller D and the impression-roller E. The types on the type-roller are so arranged that they print on the paste-

board the desired words, in the manner indicated in Fig. 6; and they are supplied with ink from the ink-fountain F by means of intermediate inking-rollers, best seen in Fig. 1. The impression-roller E is covered with India rubber or other suitable soft and elastic material. After having received the impression, the sheet of pasteboard passes through between the cutting-rollers G H. The lower roller H is a plain steel roller, while the upper roller G contains the cutters  $a a'$  and the creasers  $b$ . The cutters are arranged as shown in Figs. 2 and 5, and their cutting-edges run in close contact with the steel roller H, and they revolve with a circumferential velocity equal to that of said roller, so that by their action the sheet of pasteboard passing through the rollers G H is cut into blanks of the form shown in Fig. 6. These blanks are cut to the exact width desired by the circular knives  $a' a'$ , which are secured in the circumference of the roller G, at the required distance apart, and between these circular cutters are situated the creasers  $b$ . These creasers are made, by preference, each of a series of detached knives or punches set close together so that they perforate the blanks in the direction of the lines where said blanks are to be folded, as indicated by dotted lines in Fig. 6. The creases produced by my perforating-creasers allow of folding the blanks quite easily, and the folded parts remain in position, and have but little tendency to return to their original position.

By referring to Fig. 6 it will be noticed that, according to my invention, the blanks are cut out with very little waste. Those parts which are detached from the sheet of pasteboard, and which form the waste, are received in the chute I which partially surrounds the roller H, and which conducts the same off through an aperture in the bed of the machine.

The blanks are conducted from the cutting-rollers through between the pasting-rollers J K, detached views of which are shown in Figs. 3 and 4. The length of the upper roller J exceeds somewhat the width of the sheet of pasteboard or of the blanks cut from said sheet; and it is made with an unbroken surface from end to end; but the roller K is provided with a groove,  $c$ , which separates a section,  $K^*$ , from the main body of said roller. This section is made in the form shown in Fig.

4, its high parts  $d d$  being equal in diameter to the main body  $K$ , so that if a blank is made to pass through between the rollers  $J K$ , the segments  $d d$ , or one of them, will come in contact with the outer portion  $d^*$  (see Fig. 6) of said blank. The segments  $d d$  of the section  $K^*$  are supplied with paste from a fountain in which revolves a paste-distributing roller,  $M$ , mounted on a shaft,  $e$ , on which is also mounted a roller,  $N$ , that bears against the main body of the roller  $K$ . By this arrangement the motion of the paste-distributing roller is continuous and the segments  $d d$  are supplied with paste without fail. As the blanks pass through between the rollers  $J K$ , in the position indicated in Fig. 6, their outer flaps  $d^*$  are supplied with paste by the segments  $d d$ ; and if the blanks are folded, as will be presently explained, the flaps  $d^*$  are pressed down upon the flaps  $e^*$  on the opposite edges. On leaving the pasting-rollers  $J K$  the blank is caused to pass under a plate,  $O$ , being drawn along during this part of its motion by rollers  $P P'$ . (See Figs. 1, 7, and 8.) The plate  $O$  is equal in width to the distance between the lines  $f f$ . On the blank and on each side of said plate is a folding wing  $g$  or  $g'$ , by the action of which the blank is folded to the position shown in Fig. 8, the folds produced being in the lines  $f f$ . The folding-wings  $g g'$  are mounted on arbors  $h h'$ , which have their bearings in standards  $i i$ , and on the inner ends of which are secured cranks  $j j'$ . (See Figs. 2 and 7.) From these cranks extend tappet-rods  $k k'$ , which are guided in a standard,  $l$ , and which bear from opposite sides against a cam,  $m$ , (best seen in Fig. 2;) one of said tappet-rods being bent at right angles, so that, as the cam revolves, the tappet-rods are caused to move in opposite directions. (See arrows marked thereon in Fig. 7.) By this motion the arbors  $h h'$  are rotated, and the wings  $g g'$  are brought from the position shown in Fig. 7 to that shown in Fig. 8. Springs  $n$ , (see Fig. 2,) which act on the arbors  $h h'$ , serve to keep the tappet-rods  $k k'$  in contact with the cam  $m$ . On the plate  $O$  is mounted a roller,  $Q$ , that acts in conjunction with a bottom roller,  $Q'$ , (Fig. 1,) so as to carry the blank partly folded, as above described, through between the stationary vertical guide-plates  $o o'$  to the second pair of folding-wings  $p p'$ . The plates  $o o'$  prevent the folded parts of the blank from returning to their original position. The wings  $p p'$  are secured to the arbors  $h h'$  in position at right angles toward the folding-wings  $g g'$ . (See Figs. 2 and 7.) After the partly-folded blank has been carried in between the wings  $p p'$ , those wings turn down, as shown in Figs. 9 and 10, and the parts  $d^*$  of the blanks are pressed down upon the parts  $e^*$ , as previously stated; and, since the parts  $d^*$  have been supplied with paste before the blanks enter the

folding mechanism, the parts  $d^*$  and  $e^*$  are firmly united, and when the blank leaves the machine, it is only required to fold in its ends, as shown in Figs. 11 and 12, and the box is finished. The folding-wings  $g g'$  and  $p p'$  are situated in such relation to each other that, while the wings  $p p'$  turn down the parts of the blank previously acted upon by the wings  $g g'$ , these wings will act on a subsequent blank, and by these means the productive capacity of my machine is materially increased.

By referring to Figs. 11 and 12 and to Fig. 6 it will be seen that the bottom of the box produced by my machine is composed of the flaps  $r s t s'$ , while the top is composed of the flaps  $u v v'$ —these flaps being folded in as shown.

The printing-rollers  $E D$ , instead of being situated in front of the cutting-rollers, might be situated behind the same; and the paste-board fed to my machine may be in sheets, or it may be taken from a roll, as previously stated.

The creasers  $b b$  on the cutting-roller  $G$  are so arranged that they crease the blanks, both in a longitudinal and in a transverse direction, at the proper places, so that the blanks, on leaving the machine, can be readily folded in the required manner.

The circumferential velocity of the pasting-rollers  $J K$  is somewhat larger than that of the cutting-rollers  $G H$ , so that, if the cutters do not separate the blanks entirely, the draft produced by the rollers  $J K$  will be sufficient to tear the same apart.

What I claim as new, and desire to secure by Letters Patent, is—

1. A machine for making boxes, composed of printing-rollers  $E D$ , cutting-rollers  $G H$ , pasting-rollers  $J K$ , and folding-wings  $g g'$   $p p'$ , all arranged and operating substantially in the manner herein shown and described.
2. The creasers  $b$ , each made of a series of detached punches or cutters, in combination with the knives  $a a'$ , which serve to cut out and crease the box, substantially as set forth.
3. The segmental pasting-section  $K^*$  of the roller  $K$ , in combination with a paste-fountain,  $L$ , and rollers  $M N$ , constructed and operating substantially in the manner shown and described.
4. The folding-wings  $g g'$   $p p'$ , mounted on shafts  $h h'$ , in combination with tappet-rods  $k k'$  acted on by cam  $m$ , substantially as set forth.
5. The stationary guide-plates  $o o'$  in combination with the folding-wings  $g g'$   $p p'$  and the intermediate carrying-rollers  $Q Q'$ , all constructed and operating substantially as shown.

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