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MANUFACTURE OF PAPER AND LIKE BAGS.
APPLICATION FILED FEB. 18, 1911.

1,003,658.

Patented Sept. 19, 1911.

2 SHEETS—SHEET 1.

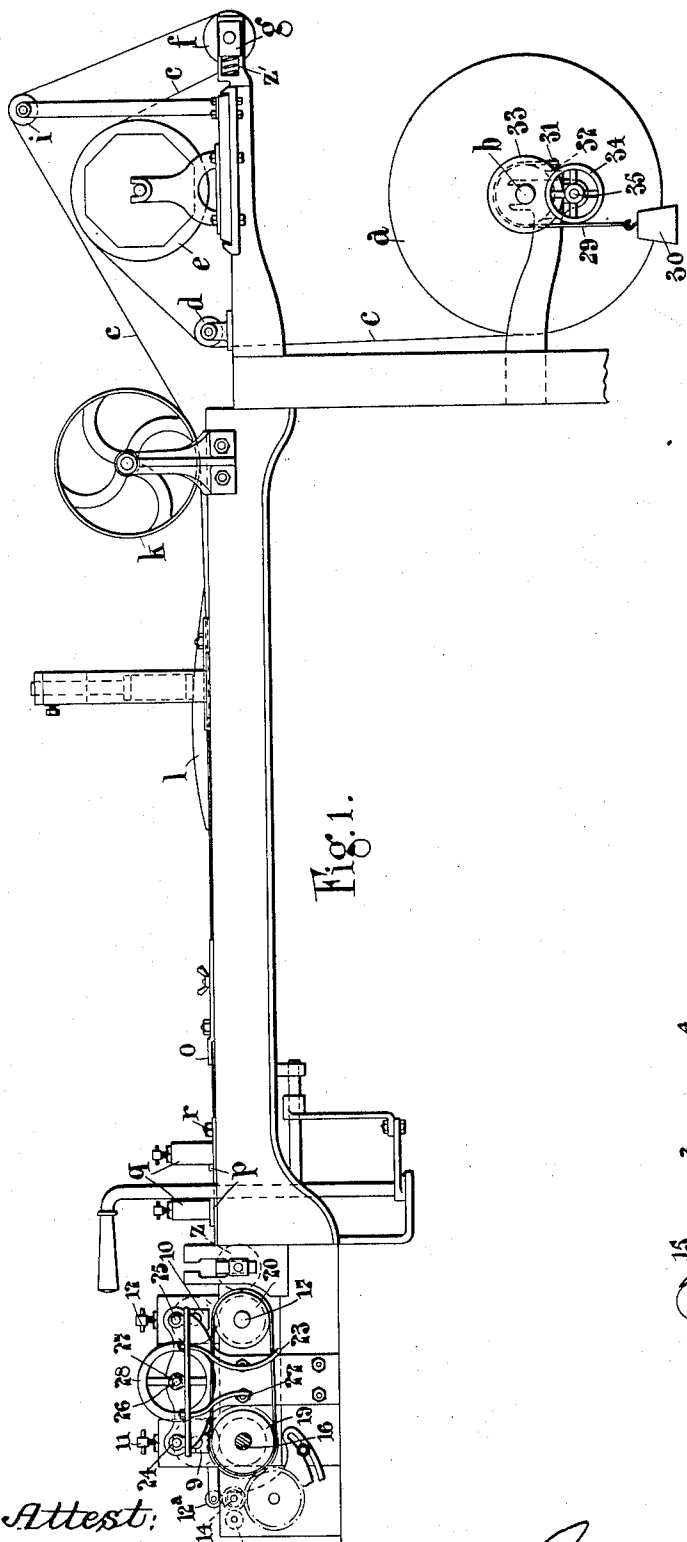


Fig. 1.

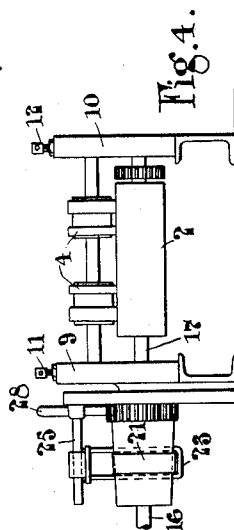


Fig. 4.

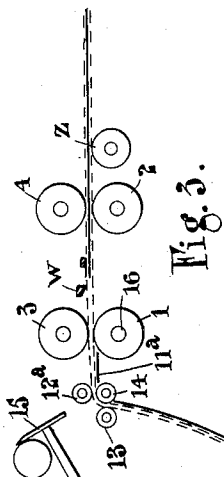


Fig. 3.

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2 SHEETS—SHEET 2.

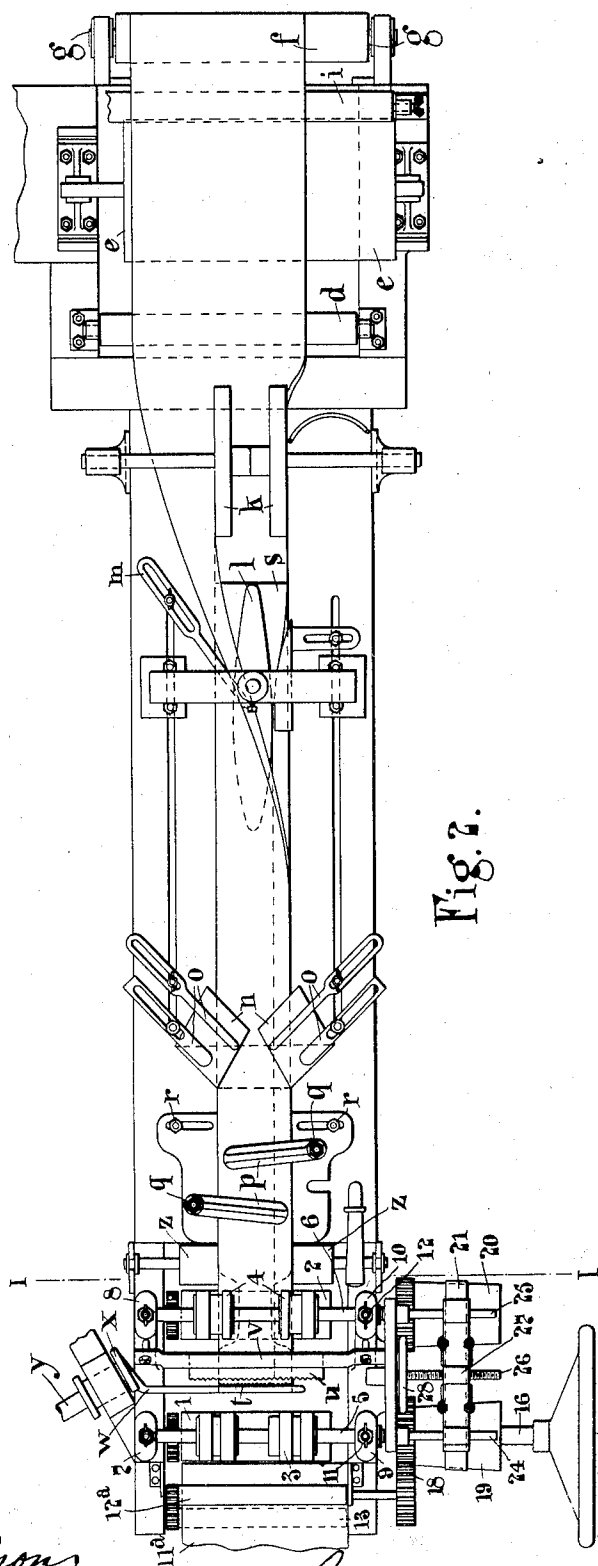


Fig. 2.

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UNITED STATES PATENT OFFICE.

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MANUFACTURE OF PAPER AND LIKE BAGS.

1,003,658.

Specification of Letters Patent.

Patented Sept. 19, 1911.

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To all whom it may concern:

Be it known that we, EDWARD ROBINSON, WILLIAM JOHN BENWELL, EDWARD CHARLES GROVES, and GEORGE HARVEY, all subjects of the King of Great Britain and Ireland, and residing at 2 Redcliffe street, Bristol, in the county of Somerset, England, have invented certain new and useful Improvements in and Connected with the Manufacture of Paper and Like Bags, of which the following is a specification.

This invention relates to the manufacture of paper bags and the like from a continuous printed web or roll of paper or similar material.

With bags which are required to be printed, made by machine from continuous rolls, it has hitherto been the practice to print them separately on a printing machine after making, or else to print them with a supplementary printing apparatus fixed to the bag making machine. The first method is a comparatively slow and expensive operation, especially when large quantities have to be dealt with, and in the second method, printing during the process of making by a supplementary printing apparatus, the great varieties of styles that are possible on a separate printing machine cannot be worked, and the quality of the printing is generally much inferior except in one or two styles.

The primary object of the present invention is to enable bags to be made in any ordinary bag making machine direct from a web or roll of paper which has been previously printed with the required matter or design. If a previously printed web were simply fed into an ordinary bag making machine it would be found that owing to the creep or lag which would occur, the printed inscription or other impression would be very soon out of position or register, and the machine would have to be repeatedly stopped to allow of the web being reset. This method would be a practical failure.

The secondary object, therefore of the present invention is to avoid the above mentioned difficulty and in such a manner that the correct register can be maintained during the continued running of the machine.

The invention will now be described with

reference to the accompanying drawings in which—

Figures 1 and 2 are a side elevation and a plan respectively of a bag making machine with the invention applied thereto. Fig. 3 is a detail of one end of the machine diagrammatically illustrating the rollers and other devices situated at such end of the machine. Fig. 4 is a cross sectional end view on the line 1—1, Fig. 1.

In carrying out the invention a bag making machine of the type illustrated in the drawings is employed. A roll, *a*, of previously printed paper is mounted in the usual manner upon a shaft, *b*, at one end of the machine. The web, *c*, from the roll is passed over a guide roller, *d*, a larger guide and pasting roller, *e*, and a tension roller, *f*, which is mounted in bearing guide blocks, *g*, adapted to slide against the action of springs *g'* and then over a guide roller, *i*, to the folding wheels, *h*. From the latter the partially folded web is passed on to the usual folding devices including a metal folder, *l*, an adjustable guide, *m*, paper folders, *n*, held down by adjustable clips, *o*, and adjustable feet, *p*, which are carried by pillars, *q*, and adapted to be secured in various positions by adjusting screws *r*.

During the folding operation the web passes over a metal former, *s*, which terminates in a toothed edge, *t*. Above the latter is a toothed edge, *u*, carried by an adjustable bar, *v*. A cutting bar or knife, *w*, extending from a segmental disk, *x*, mounted on a shaft, *y*, is adapted to sharply strike the web adjacent to the toothed edges, *t u*, in order to cut the web into the predetermined lengths for forming the bags. The web is drawn along over the former, *s*, under the various folding devices and over a guide roller, *z*, by means of two sets of drawing rollers. These sets of drawing rollers comprise rollers 1 and 2, and upper rollers, 3 3 and 4 4. The lower rollers, 1 and 2, are positively driven in the ordinary manner while the upper rollers, 3, 3, and 4, 4, are mounted on shafts, 5 and 6 respectively, the ends of which are carried in bearing blocks, 7 and 8, adapted to slide vertically in journals, 9 and 10. The bearing blocks,

7 and 8, are adapted to be pressed downwardly by adjusting screws, 11 and 12, so that the pressure of the rollers, 3, 3, and 4, 4, upon the web and upon the lower rollers, 1 and 2, may be adjusted as desired. The rollers, 3, 3, and 4, 4, are preferably provided with projecting ridges of rubber, and various forms and dimensions of rollers, 3, 3, and 4, 4, may be kept in stock and exchanged according to the type of paper that is to be fed or drawn forward.

From the drawing rollers the several lengths of web pass over a plate, 11^a, to three rollers, 12^a, 13 and 14 arranged very closely together as illustrated diagrammatically in Figs. 1 and 3. As the severed lengths pass over the roller, 14, and between the rollers, 12^a and 13, an oscillating dipper, 15, applies paste to them.

All the parts so far described are those common to the type of machine illustrated by way of example.

If a previously printed roll of paper, *a*, were employed in a machine as above described the paper would be set initially so that the knife, *w*, would cut off the lengths at positions in correct relation to the printed matter or designs on the paper. It would be found, however, that with a fixed rate of feed the designs or printed matter would soon be out of register or position in relation to the knife, *w*, and the machine would have to be repeatedly stopped to allow the paper to be reset. To overcome this difficulty our process accelerates or retards the rate of feed according as the web lags or creeps. For instance the drawing rollers, 1 and 2, are mounted upon shafts, 16 and 17 respectively. Upon the shaft, 16, a gear wheel, 18, is mounted and this is driven from the usual train of gearing adapted to be changed according to any predetermined speed or rate of feed. The shafts, 16 and 17, are further provided respectively with cone pulleys, 19 and 20, the taper of the cones being oppositely arranged. A driving belt, 21, passes around the cone pulleys, 19 and 20, and this is adapted to be shifted by means of iron loops, forks or similar devices, 22 and 23, carried by a yoke, 24, adapted to be moved on guide rods, 25, by means of a central screw, 26, passing through a threaded boss, 27, and adapted to be rotated by a hand wheel, 28. By this means, after a predetermined rate of feed has been set, should any creep or lag occur, the speed of the drawing rollers, 2 and 4, may be retarded or accelerated until the printed matter has again been brought into register. This of course is accomplished by rotating the hand-wheel 28 in one direction or the other to accelerate or retard the rotation of the rolls 2 and 4 until the printed matter is restored to register and then re-

turning the hand wheel 28 to its former

position in which the rolls 2 and 4 are given their predetermined rate of speed. By the aid of the belt shifting device both retardation and acceleration of the rate of feed can be effected, but retardation alone can be readily effected by the operator simply grasping the cone pulley, 20, in the hand so as to slightly retard it, the belt, 21, then slipping slightly. This provides a simple, convenient, but yet effective means for retarding the rate of feed to overcome the difficulties of creep. The requisite tension is applied to the web by the tension roller, *f*, hereinbefore referred to and also by a brake, comprising for instance a brake strap, 29, having one end secured to a weight, 30, and the other end to a hook, 31, on a block, 32, pressing against a grooved pulley, 33, over which the strap, 29, is passed. The tension can, therefore, be varied by the weight, 30, and also by adjusting the block, 32, by means of a hand wheel, 34, on the screwed spindle, 35, on which the block, 32, is mounted.

With the arrangement above described it is possible to make bags direct from a previously printed roll and to maintain the printed matter or design in correct position or register during the continuous running of the machine, the requisite adjustment being readily and quickly controllable by the operator. By suitably arranging the printing upon the web, bags may be made having printing upon one or both sides, in one, two or more colors or on one or both sides, thereby effecting great saving both in time and labor as compared with the usual methods wherein bags are printed after manufacture.

The invention is applicable to machines for making the usual types of bag, for instance, plain or flat bags with side or central seams, satchel shaped bags, and block bottom bags of all forms. The invention is also applicable to bags having printing on one or both sides and whether made of paper or of any other similar material.

Having now described our invention what we claim as new and desire to secure by Letters Patent is:—

1. In a bag making machine the combination with constantly rotating blank advancing rolls, of tube advancing rolls, intermittently actuated severing mechanism between the two sets of rolls for cutting the tube into bag blanks, non-positive driving means adapted to normally rotate the tube advancing rolls with a fixed velocity relative to that of the blank advancing rolls, and manually actuated mechanism adapted to temporarily increase or decrease the angular velocity of the tube advancing rolls without interfering with the operation of the blank advancing rolls or permanently disturbing the speed of the tube advancing rolls.

2. In a bag making machine the combination with constantly rotating blank advancing rolls, of tube advancing rolls, intermittently actuated severing mechanism between the two sets of rolls for cutting the tube into bag blanks, non-positive flexible driving means adapted to normally rotate the tube advancing rolls with a fixed velocity relative to that of the blank advancing rolls, and manually actuated mechanism adapted to temporarily increase or decrease the angular velocity of the tube advancing rolls without interfering with the operation of the blank advancing rolls or permanently disturbing the speed of the tube advancing rolls.

3. In a bag making machine adapted to make bags from a continuous and printed web, means for folding the web into a tube, a pair of tube advancing rolls, a pair of constantly rotating blank advancing rolls, intermittently actuated severing mechanism between the two sets of rolls for cutting the tube into bag blanks, non-positive flexible driving means adapted to normally rotate the tube advancing rolls with a fixed velocity relative to that of the blank advancing rolls, and manually actuated mechanism adapted to temporarily increase or decrease the angular velocity of the tube advancing rolls without interfering with the operation of the blank advancing rolls or permanently disturbing the speed of the tube advancing rolls.

4. In a bag making machine, the combination with constantly rotating blank advancing rolls, of tube advancing rolls, intermittently actuated severing mechanism between the two sets of rolls for cutting the tube into bag blanks, non-positive driving mechanism connecting the blank and tube advancing rolls whereby the tube advancing rolls are normally rotated at a constant speed relative to the speed of the blank advancing rolls and a manually controlled adjusting mechanism for temporarily increasing or decreasing the angular velocity of the tube advancing rolls with-

out disturbing the operation of the blank advancing rolls or permanently disturbing the speed of the tube advancing rolls.

5. In a bag making machine adapted to make bags from a continuous and printed web, means for folding the web into a tube, a pair of tube advancing rolls, a pair of constantly rotating blank advancing rolls, intermittently actuated severing mechanism between the two sets of rolls for cutting the tube into bag blanks, non-positive driving mechanism connecting the blank and tube advancing rolls whereby the tube advancing rolls are normally rotated at a constant speed relative to the speed of the blank advancing rolls, and a manually controlled adjusting mechanism for temporarily increasing or decreasing the angular velocity of the tube advancing rolls without disturbing the operation of the blank advancing rolls or permanently disturbing the speed of the tube advancing rolls.

6. In a bag making machine adapted to make bags from a continuous and printed web, means for pressing and folding the web into a tube a pair of tube advancing rolls, a conical pulley on one of said rolls, a pair of constantly rotating blank advancing rolls, a conical pulley on one of said rolls, and arranged with its conicity opposite to that of the conical pulley of the tube advancing rolls, intermittently actuated severing mechanism between the two sets of rolls for cutting the tube into bag blanks, a belt operatively connecting the conical pulleys, and means for shifting said belt along said pulleys for the purposes hereinbefore set forth.

In testimony whereof we have signed our names to this specification in the presence of two subscribing witnesses.

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EDWARD CHARLES GROVES.

GEORGE HARVEY.

Witnesses:

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