

E. ROBINSON, W. J. BENWELL, E. C. GROVES & G. HARVEY.
MANUFACTURE OF PAPER AND LIKE BAGS.
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985,285.

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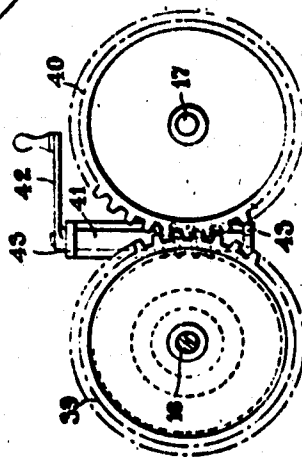
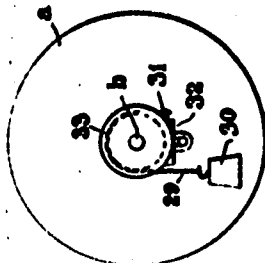
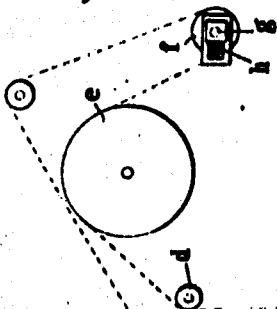


Fig. 2.

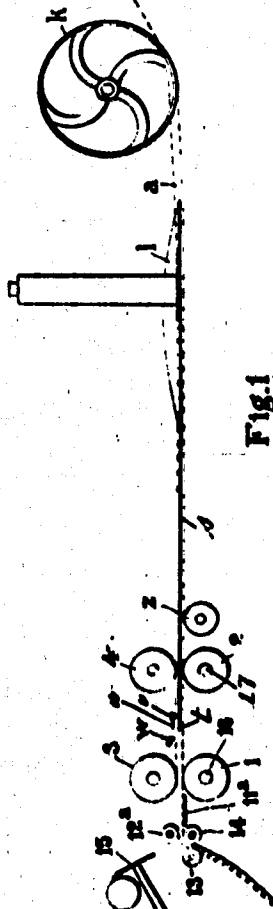


Fig. 1

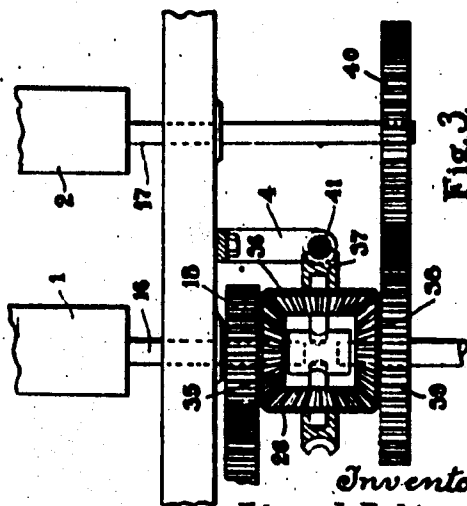


Fig. 3.

Attest:
Edw. A. Tolson
Edward H. Linton

Inventors
Edward Robinson,
William J. Benwell,
Edward C. Groves,
George Harvey,
By Spear, Middleton, Duncanson & Spear

UNITED STATES PATENT OFFICE.

EDWARD ROBINSON, WILLIAM JOHN BENWELL, EDWARD CHARLES GROVES, AND
GEORGE HARVEY, OF BRISTOL, ENGLAND, ASSIGNORS TO E. S. AND A. ROBINSON
LIMITED, OF BRISTOL, ENGLAND.

MANUFACTURE OF PAPER AND LIKE BAGS.

985,285.

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Application filed March 30, 1909. Serial No. 496,788.

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 consists essentially in the combination with a bag making machine of means for accelerating or retarding the rate of feed according as the web lags or creeps, so that the correct register of the printed or other impression on the bags may be maintained.

The accompanying drawings illustrate two modes of carrying the invention into effect.

Figure 1 is a diagram of the various rollers of one form of bag making machine illustrating the course of the web as far as the folding and cutting operations are concerned. Figs. 2 and 3 are respectively a side elevation and plan illustrating the mode of carrying out the invention.

In carrying out the invention a bag making machine of the type illustrated in the figures 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, *h*, and then over a guide roller, *i*, to the folding wheels, *k*. From the latter the partially folded web is passed on to the usual folding devices including a metal folder, *l*. During the folding operation the web passes over a metal former, *m*, which terminates in a toothed edge *n*. Above the latter is a toothed edge, *o*, carried by an adjustable bar, *p*. A cutting bar or knife, *q*, is adapted to sharply strike the web adjacent to the toothed edges, *t* *u*, in order to cut the web into the pre-determined lengths for forming the bags. The web is drawn along over the former, *s*, under the various folding devices and over a guide roller, *x*, 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 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 severed

lengths of web pass over a plate, 11, to three rollers, 12, 13 and 14 arranged very closely together as illustrated diagrammatically in Fig. 1. As the severed lengths pass over the roller, 14, and between the rollers, 12 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 shaft, 17, and the drawing roller, 2, are driven from the shaft, 16, and the drawing roller, 1, through the medium of a differential gear. For instance, a bevel wheel, 35, mounted upon the shaft, 16, or formed integrally with the toothed wheel, 18, meshes with bevel pinions, 36, carried on radial pins mounted within the work wheel, 37, the pinions, 36, also meshing with and driving a bevel wheel, 38, secured to or formed integrally with a toothed wheel, 39, driving a toothed wheel, 40, upon the shaft, 17, of the drawing roller, 2. A worm spindle, 41, carried in a bracket, 43, is adapted to be rotated by a handle, 42, or hand wheel, so as to rotate the worm wheel, 37, in one direction or the other according as the speed of rotation of the shaft 17 of the drawing roller, 2, is to be retarded or accelerated. In use the usual change gear is arranged to drive the drawing rollers, 1 and 2, at the requisite speed and the web is set in relation to the knife so as to bring the printing in register. Then as creep or lag occurs the handle, 42, is rotated in one direction or the other so as to retard or accelerate the speed of the roller, 2.

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, 33, on the screwed spindle, 34, 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 the 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, 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 rotated blank advancing rolls, of tube advancing rolls, and intermittently actuated severing mechanism arranged between the two sets of rolls for severing the tube advanced into bag blanks, and gearing for driving the tube advancing rolls normally serving to drive said rolls at a constant speed relative to the speed of the blank advancing rolls, said gearing including a manually controlled adjusting mechanism whereby the angular velocity of said tube advancing rolls may be temporarily increased or decreased without interfering with the operation of the machine or permanently disturbing the angular velocity of the tube advancing rolls.

3. In a bag making machine, the combination with the constantly rotated blank ad-

- vancing rolls, of tube advancing rolls, and intermittently actuated severing mechanism arranged between the two sets of rolls for severing the tube advanced into blanks, and
 5 a train of gearing connecting the blank advancing 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, including
 10 a pair of gears and including a manually controlled adjusting mechanism for angularly adjusting one gear of the train relative to another of the train to temporarily increase or decrease the relative rate of speed
 15 of the tube advancing rolls and blank advancing rolls without disturbing the operation of the blank advancing rolls or perma-

nently disturbing the speed of the tube advancing rolls.

In testimony whereof, we affix our signatures in presence of two witnesses.

EDWARD ROBINSON.

WM. JOHN BENWELL.

EDWARD CHARLES GROVES.

GEORGE HARVEY.

Witnesses to signature of Edward Robinson:

EVELYN ROBINSON,

EDWARD LEWIS DURZ.

Witnesses to signatures of William John Benwell, Edward Charles Groves, and George Harvey:

FOSTER A. ROBINSON,

TOM LEE.