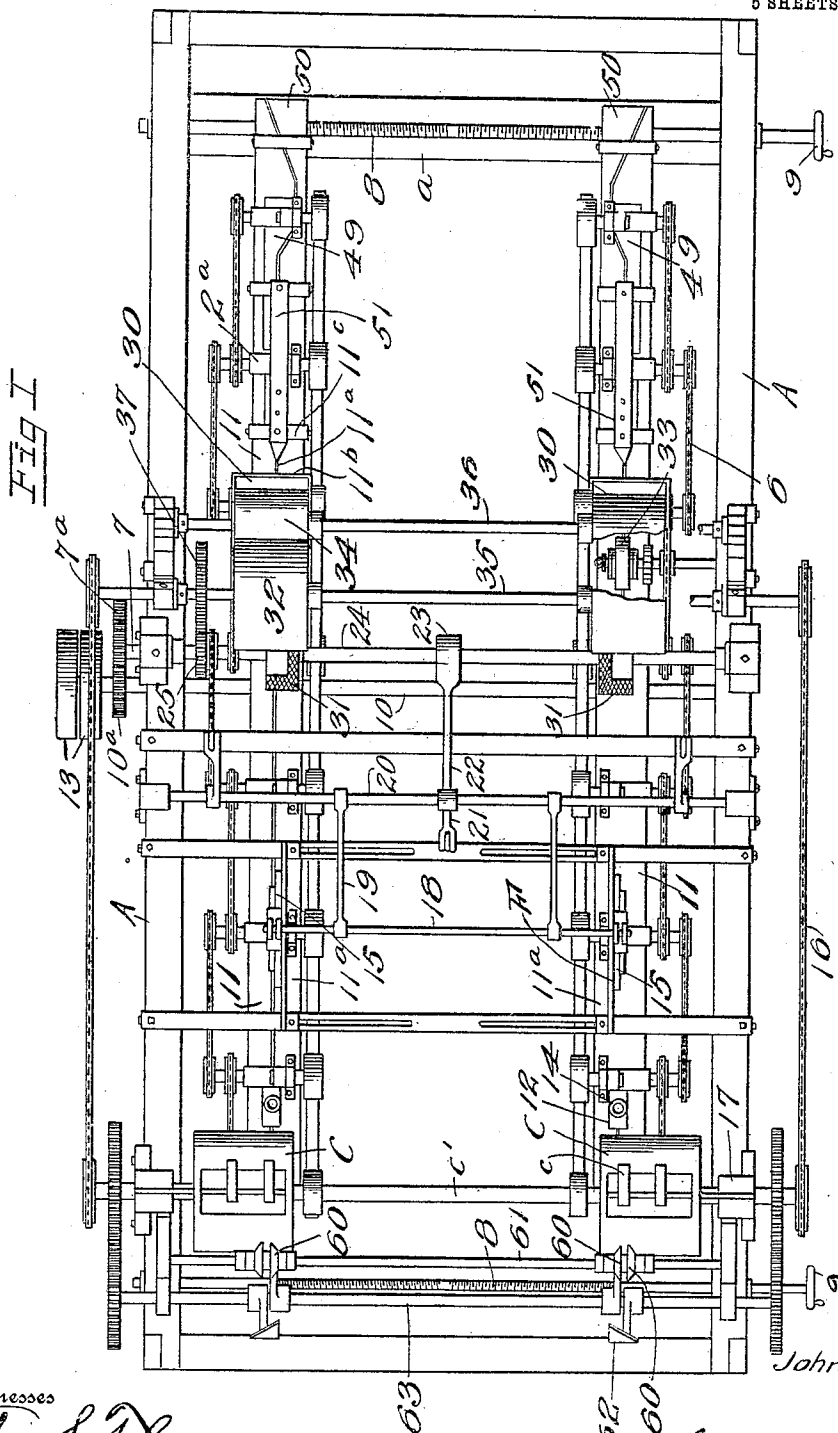


J. ROGERS, DEC'D.
J. GOLDSWORD, ADMINISTRATOR.
PAPER BAG MACHINE.
APPLICATION FILED APR. 8, 1908.

945,731.

Patented Jan. 4, 1910.

5 SHEETS—SHEET 1.



Witnesses

Geo S. Shaw
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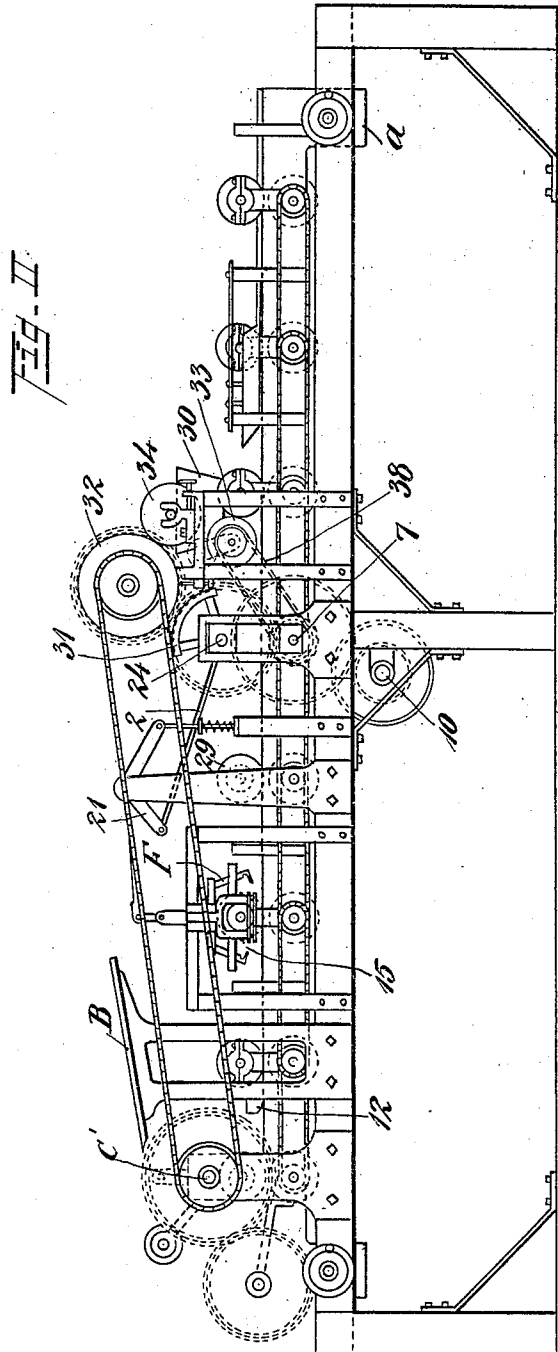
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Patented Jan. 4, 1910.

5 SHEETS—SHEET 2.



Witnesses:

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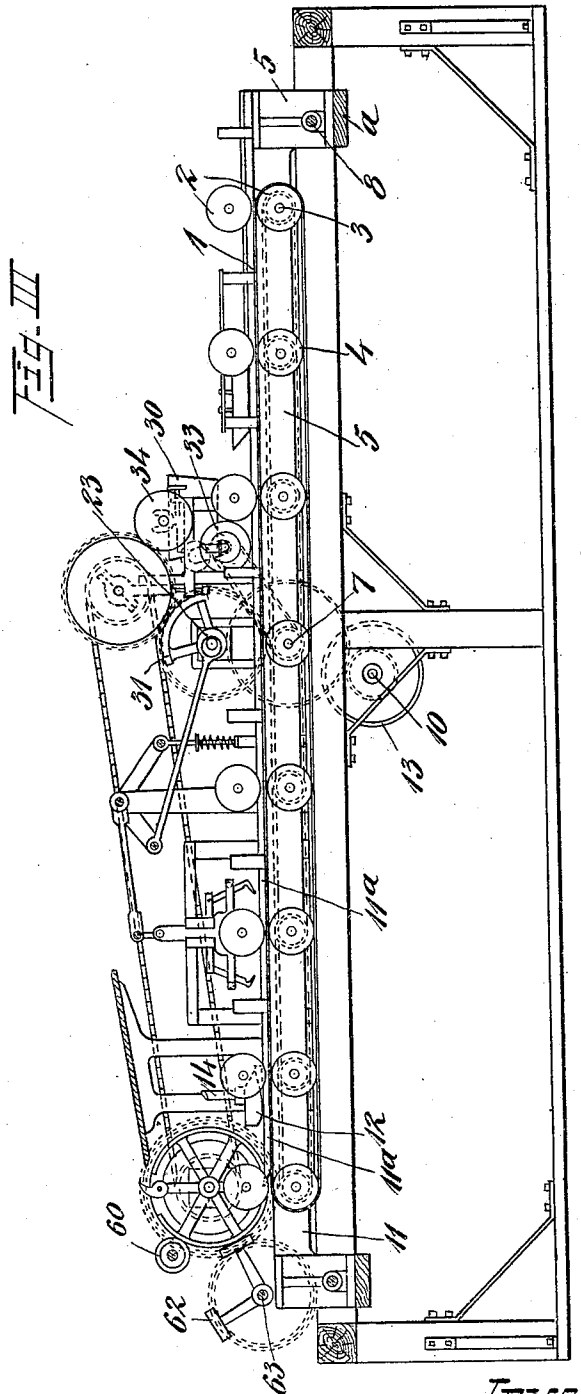
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5 SHEETS—SHEET 3.



Witnesses:
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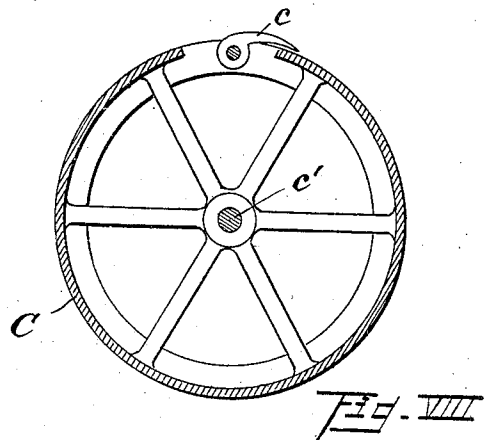
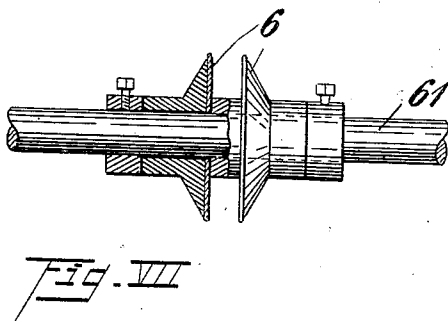
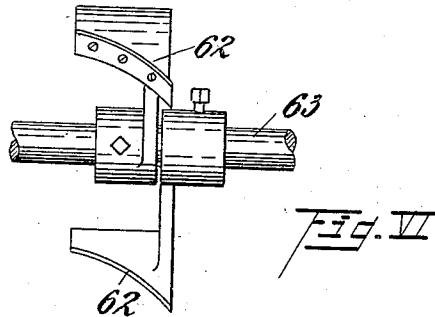
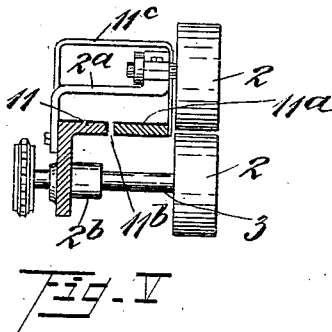
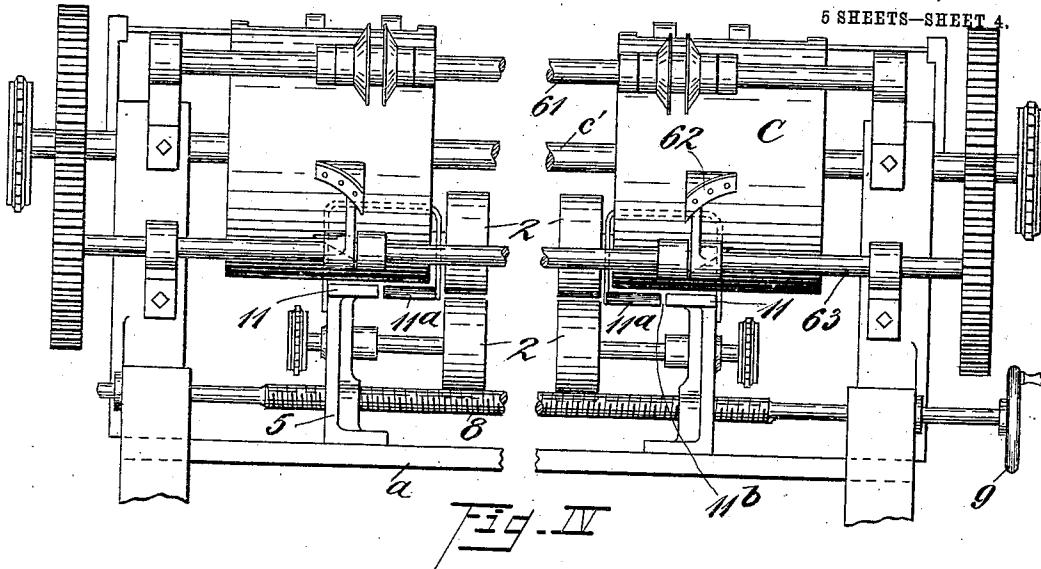
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APPLICATION FILED APR. 6, 1908.

945,731.

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5 SHEETS—SHEET 4.



Witnesses:

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APPLICATION FILED APR. 6, 1908.

Patented Jan. 4, 1910.
5 SHEETS—SHEET 5.

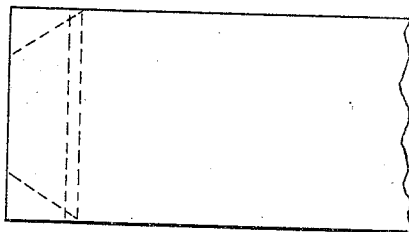


Fig. IX

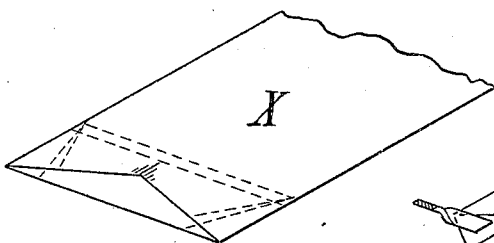


Fig. X

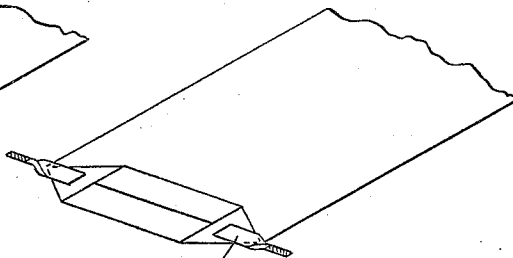


Fig. XI

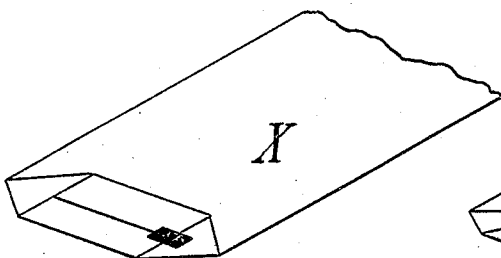


Fig. XII

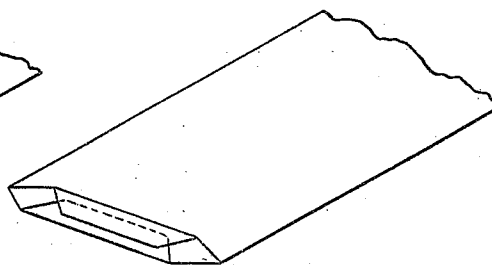


Fig. XIII

Witnesses:

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J. A. Bannhardt

Inventor.

John Rogers

UNITED STATES PATENT OFFICE.

JOHN ROGERS, OF CLEVELAND, OHIO; JAMES GOLDSWORD, ADMINISTRATOR OF SAID JOHN ROGERS, DECEASED, ASSIGNOR TO CLEVELAND-AKRON BAG COMPANY, OF CLEVELAND, OHIO, A CORPORATION OF OHIO.

PAPER-BAG MACHINE.

945,731.

Specification of Letters Patent.

Patented Jan. 4, 1910.

Application filed April 6, 1908. Serial No. 425,372.

To all whom it may concern:

Be it known that I, JOHN ROGERS, citizen of the United States, residing at Cleveland, in the county of Cuyahoga and State of Ohio, have invented certain new and useful Improvements in Paper-Bag Machines, of which the following is a specification.

This invention relates to machinery for making paper bags and has especial reference to automatically acting mechanism for constructing a satchel end on what is known to the trade as a valve bag, and the machine is adapted to construct the satchel end upon both extremities of a bag tube, which may in addition to its use to form a double ended bag be made long enough to cut transversely in two, in the middle and thus form two bags, each provided with a satchel bottom, but open at the top, thus doubling the capacity and efficiency of the machine.

The machine is designed to automatically form the satchel or valve end, by first opening the free ends of the tube, spreading the free edges and forming corners therein, flattening and gluing the spread parts and inserting the cloth valve lining, and finally folding to a complete shape while the bag tube is in continuous motion therethrough each action being performed in its turn and relatively timed to the prior and succeeding movements.

The several operations required to form the satchel or valve extremities upon the bag tube are alike for each end and are simultaneously carried on while the tube passes through the machine, hence a description of the mechanism required to form the satchel and valve at one end of the tube will answer for a description of the mechanism required to form the satchel and valve at the other end thereof.

The bag tube after being cut to the required length to form a double ended bag tube is fed to the machine and at each end is received between rollers and an endless apron or band from which the ends project between guide plates so that they can be acted upon by the satchel and valve forming devices without checking the movement of the bag tube.

Each satchel or valve end is formed upon the tube as follows: The tube after entering between the rollers and the endless bands, passes over a plate running the whole length

of the machine, and the end is opened by means of suction obtained by air drawn through openings in the inclined walls of suction boxes, this suction draws apart the sides of the bag mouth and permits of the spreading of the side edges of the mouth by folding one edge back upon one of the plates underneath which the bag moves. The bag end is then passed under suitable devices for gluing the folds and feeding and attaching the strip of cloth, and finally passes through devices for folding the spread sides over each other, on the creased lines.

In this device all movements are obtained automatically from a central source of power and the various parts are manipulated by means of various devices whereby the successive movements can be accurately timed.

A leading and important feature of the invention lies in the capacity of the machine to turn out perfect work in large quantities and also in its adjustability to enable it to manufacture several sizes of bags, and to manufacture a doubled number of bags having only one valve or satchel end, for each bag. This adjustability to provide double ended bags of varying length or to provide bag tubes of double length which can be centrally cut in two, to form two bags from each bag tube, is obtained by separating or drawing together the separate sets of mechanism which form the duplicate ends on the tube and stand in reversed position, and the supporting frames therefor are independent and movable relatively toward and from each other.

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

Figure 1 is a top plan view of the machine, with the feeding table removed. Fig. 2 is a side elevation of the machine. Fig. 3 is a vertical longitudinal section. Fig. 4 is a partial end elevation. Fig. 5 is a detail in section showing the guides for the bags and one pair of rollers. Figs. 6 and 7 are details of creasers which act on the ends of the bag blank as it passes around the feed cylinders. Fig. 8 is a detail in section of the feeding cylinder. Figs. 9 to 13 inclusive are illustrations of the bag blank in various conditions of manufacture.

The machine as a whole is supported upon a frame A, which is of proper size and shape to support the parts to be hereinafter de-

scribed. This frame has particularly cross bars *a* at opposite ends on which the duplicate sets of bag-forming instrumentalities are mounted in such position that they may be moved toward or from each other. At each side of the machine is an angular rail 11 along the top flange of which the ends of the bags travel, and the pillars 5 at the ends of this rail rest upon the cross bars *a* and are thus supported. Each rail carries a series of upper and lower drums or rollers 2 arranged in pairs at suitable distances apart, and an endless belt 1 passes around the lower rollers of the various pairs. The upper rollers are supported by brackets 2^a fastened to the rail (see Fig. 5), and the shafts of the lower rollers are mounted directly in bearings 2^b in said rail. These rollers and belts form duplicate sets of conveying devices which engage the bag tube or blank at opposite ends and carry the same through the machine. The shafts 3 of the lower rollers are driven by a succession of chain and sprocket gearings indicated at 6, whereby they are all driven at the same time, being actuated primarily by sprockets on a cross shaft 7 at or about the middle of the machine, and this shaft 7 has a gear 7^a which meshes with a gear 10^a on the main driving shaft 10 which extends across under the bed of the machine and carries at one end the pulleys 13 to which the power is applied. The chain and sprocket gearing is duplicated at opposite sides of the machine, to operate the duplicate conveying devices.

The pillars 5 of the opposite rails 11 are connected at each end by right and left screws 8 which extend through said pillars and which when turned by the hand wheels 9 move said supporting rails laterally toward and from each other, to enable the conveying and bag-forming devices to operate upon blanks or tubes of different lengths. Each of the rails carries a set of devices for cutting, spreading, pasting, folding and completing satchel ends upon the bag tubes, and these devices will now be briefly described, although it is to be understood that other equivalent devices may be substituted within the scope of the invention.

The bag blanks are fed from a table B mounted upon the side frame of the machine and are fed forwardly therefrom onto a feeding cylinder C which has grippers *c* arranged to engage the corresponding end of the bag and carry the same around the cylinder and deliver the same to the guide rails. Each of these cylinders is driven by a chain belt 16 from a shaft to be hereinafter referred to. The shaft of the cylinder is mounted in a box 17 on the main frame. As each tube or blank passes around with said cylinder it receives the impression of the edges of a pair of creasing disks 60 mounted upon a shaft 61 extending across

the machine and adjustable thereon according to the work; and the blanks also receive the impression of angular creasing segments 62 adjustably carried on a cross shaft 63, and these segments give the diagonal creases illustrated in dotted lines in Figs. 9 and 10, in which the bag tube or blank X is shown. The shafts 61 and 63 are driven by spur gearing from the shafts *c'* of the cylinder C.

The grippers of each feeding cylinder release the bag tube when it reaches the conveying belt 1 and deliver the same onto said belt with its end resting upon the rail 11, and the first upper roller 2 forces the adjacent body part of the bag under the guide plate 11^a which extends the length of the machine parallel to the rail 11 and inside of the same and at a slight distance therefrom, and the end of the bag to be worked on thus projects through and above the slot 11^b between the rail and the plate in position to be operated on by the bag-forming devices. The guide plate 11^a is supported by overhanging brackets 11^c fixed to the rail 11. The end of the blank is first acted on by the suction box 12 which is located above the rail and connected with an exhaust tube 14 through which the air is drawn from the box, causing the bag tube to separate or open as shown in Fig. 10. Then the bag passes to the spreading and flattening devices indicated as a whole at 15. The construction and operation of these devices will be found particularly described and claimed in my co-pending application, No. 388,526 and, it is believed, need not be herein particularly described, except that the device has oppositely acting fingers F and a head which reciprocates up and down, causing the fingers F to work toward and from each other, and to spread and flatten the bag end and form the corners thereof, as shown in Fig. 11. The mechanisms on opposite sides are operated by a cross bar 18 which is carried by arms 19 projecting from a rock shaft 20 which is vibrated by a lever 21 connected by a rod 22 to an eccentric 23 operated by a cross shaft 24 which is driven by gearing 25 from the shaft 7 below the same. After passing the spreading and flattening devices the tube is conveyed to and under the gluing devices which consist of a glue applying segment 31 carried by the shaft 24 and which receives its glue from the glue roller 32 supplied by a small roller 34 from the glue pot 30. The glue rollers 32, at opposite sides, are mounted upon the cross shaft 35 and the rollers 34 are mounted upon a cross shaft 36, the former being driven by gearing 37 from the shaft 24, and the various rollers may be shifted along said shafts to the proper position to cooperate with the glue applying segment according to the length of the bags being made.

The devices for applying the cloth or valve patch (see Fig. 12) to the ends of the tube are indicated at 33. These devices will be found also more particularly described in my application above referred to, but inasmuch as any of the well known devices for the purpose may be used, it is thought that an extended description thereof is unnecessary. Each of said devices is driven from the shaft 7 by chain and sprocket gearing indicated at 38. The cloth patch is applied to the glued surface of the bag, across the fold thereof, as shown in Fig. 12. The blank is next conveyed to the formers 51 each of which positions the flaps of the bag bottom or end in readiness to be successively lapped over each other by means of the curved or angular edges of the turning plates or folders 49 and 50 which are mounted upon the rail 11, the first device, 49, turning over one side and the second device turning the other side over upon the first and bringing the glued part together as shown in Fig. 12 and pressing the same to adhesion. The bags then pass out or off the guide rails at the rear end of the machine, and they may if necessary be run through a pair of rollers at the end of the machine.

The various operating parts will be constructed to operate in harmonious succession of movements and properly timed for the various actions, to perform the bag-forming operations indicated and to provide continuous movement of the tube during the formation of the bag.

I claim:

1. In an automatic machine organized to form two satchel ends upon a bag tube, the combination of duplicate sets of instrumentalities for conveying the bag tube for separating, spreading and forming the edges of the open ends of the tube, and for flattening, gluing and folding and pressing the said ends to form the satchel ends, supports for said duplicate sets of instrumentalities, and means for increasing or diminishing the distance between said supports, to permit of varying the length of the bag tube, substantially as described.

2. In an automatic machine organized to form two satchel ends upon a bag tube, the combination of duplicate sets of tube conveying devices, and satchel end forming devices, arranged parallel to each other, supports for said duplicate sets of devices, guides upon which one of said supports slides and means for adjusting the relative distance between said supports to permit of varying the length of the tube, substantially as described.

3. In an automatic machine organized to construct duplicate satchel ends upon a bag tube, the combination of duplicate sets of conveying devices and duplicate sets of satchel end forming devices, a common source of power for both sets of devices, means for manipulating each device employed in forming said satchel ends, whereby said satchel ends are formed in a continuous manner when passing over the conveying devices, said manipulating means being operatively connected with said common source of power, a support for each of said duplicate set of conveying devices and satchel end forming devices, said supports being adjustable relatively to each other, and adjusting means therefor, substantially as described.

4. In an automatic machine for putting duplicate satchel ends upon a valve bag tube, the combination of duplicate sets of conveying devices, duplicate sets of separating, spreading and forming devices for the ends of the bag tube, duplicate sets of pressure rolls, gluing devices, cloth valve attaching devices, folding devices and pressing devices, a common source of power for said sets of devices, and manipulating means therefor operatively connected with said common source of power, each of said sets of devices being adjustable to and from its duplicate set, whereby the length of the bag tube may be varied, substantially as described.

In testimony whereof I affix my signature, in presence of two witnesses.

JOHN ROGERS.

Witnesses:

JOHN A. BOMMARDT,
MONROE E. MILLER.