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J. GOLDSWORD, ADMINISTRATOR.
PAPER BAG MACHINE.
APPLICATION FILED AUG. 14, 1907.

928,885.

Patented July 20, 1909.

3 SHEETS—SHEET 2.

Fig. 3.

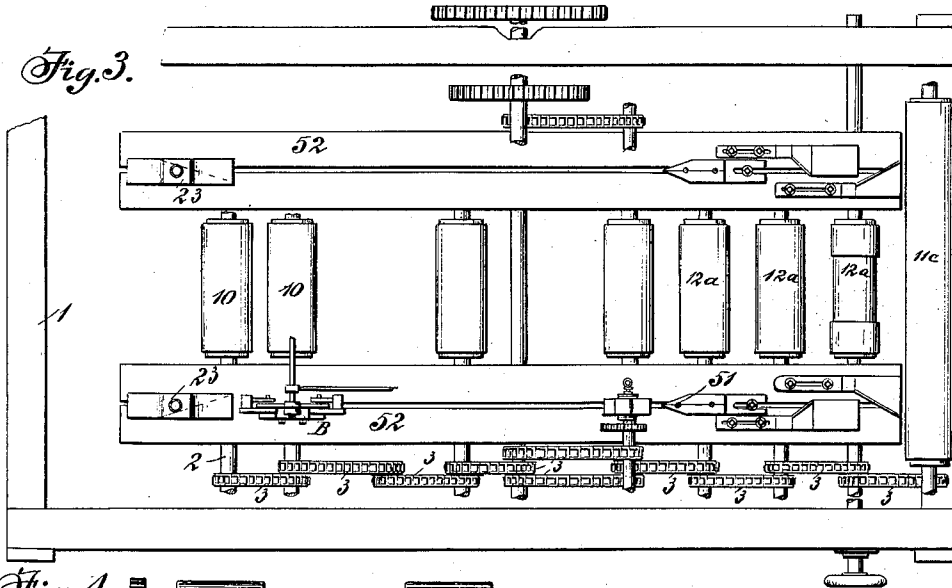


Fig. 4.

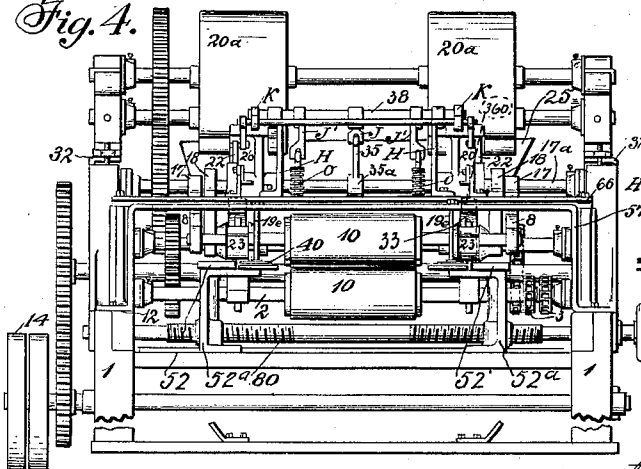


Fig. 5.

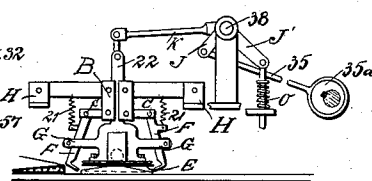


Fig. 7.

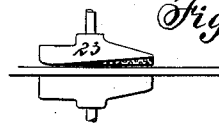


Fig. 6.

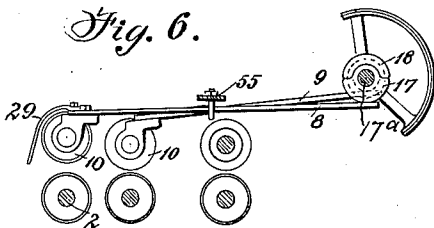
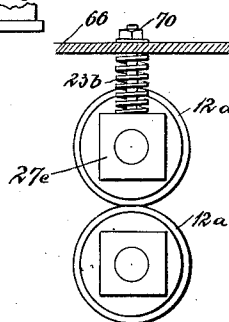


Fig. 11.



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Witnesses

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3 SHEETS—SHEET 3.

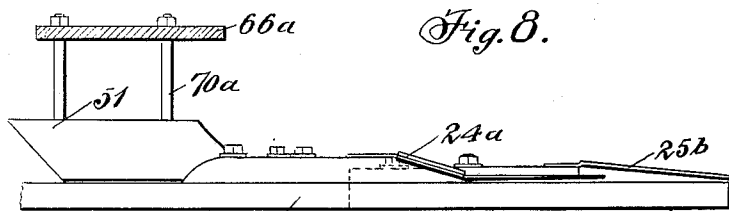


Fig. 8.

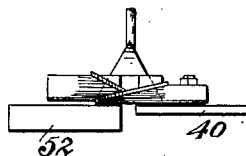


Fig. 10.

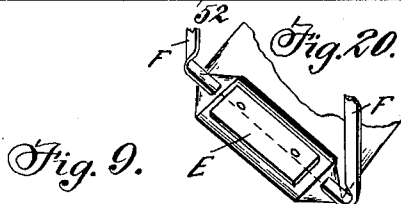


Fig. 9.

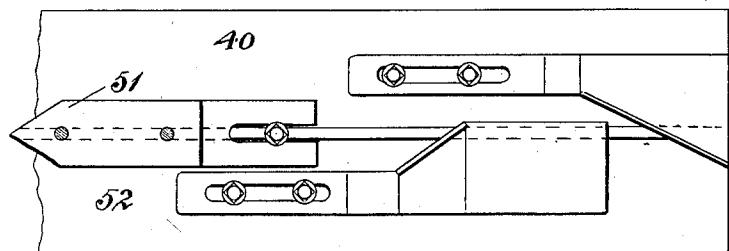
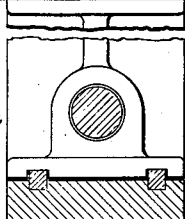


Fig. 12.



Fig. 13.

Fig. 14.

Fig. 15.

Fig. 16.

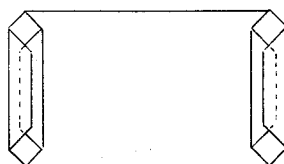
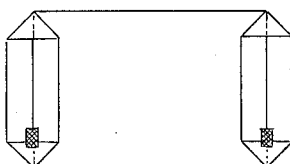
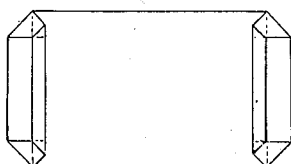


Fig. 19.

Fig. 18.

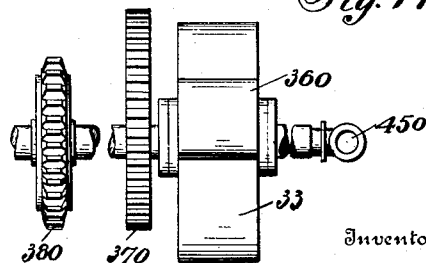
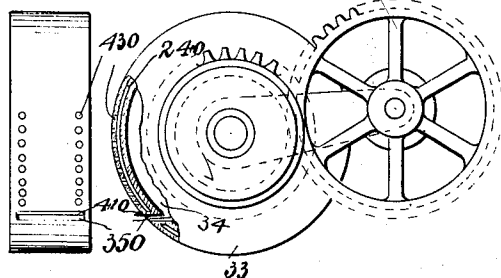


Fig. 17.

Witnesses

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UNITED STATES PATENT OFFICE.

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

PAPER-BAG MACHINE.

No. 928,885.

Specification of Letters Patent.

Patented July 20, 1909.

Application filed August 14, 1907. Serial No. 388,526.

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 machines 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 the 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 timed relatively to the prior and succeeding movements.

The several operations required to form the valve ends 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 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 by hand or by means of any suitable feeding device to the machine and is received between a pair of rolls, and the satchel or valve end is formed upon the tube by means of suction boxes, one being above and one below the tube. This suction draws apart the sides of the bag mouth and permits the spreading of the side edges of the mouth by folding one edge back upon a thin plate underneath which the bag moves, and which extends the entire length of the machine. The bag end is then carried underneath side

guiding plates which holds the edges down until flattened by means of a roller until they will keep their shape, and are in condition for subsequent folding and gluing, and for the attachment of a strip of cloth, to form the valve if a valve bag is desired. The bag end is then passed under suitable devices for creasing the spread edges on the lines of the final folds, for final gluing and finally passes through devices for folding the spread sides over each other, on the creased lines, and a set of rollers finish the flattening and cause the perfect adhesion of the parts by applying pressure thereto.

In this device all the movements are obtained from a central source of power and the various parts are manipulated by means of various cam 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 double 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 varying length, 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.

In the accompanying drawings, Figure 1 is a side elevation of the machine. Fig. 2 is a top plan view. Fig. 3 is a plan view with parts removed. Fig. 4 is a partial end elevation. Fig. 5 is a detail in end view showing the mechanism for spreading the bag ends. Fig. 6 is a detail in longitudinal vertical section of the feed rolls. Fig. 7 is a detail of one of the suction boxes. Fig. 8 is a detail in side elevation of the bag end former. Fig. 9 is a plan of the former and associated parts. Fig. 10 is an end view of the parts shown in Fig. 9. Fig. 11 is a detail in side view of the flattening rolls. Figs. 12, 13, 14, 15 and 16 are views of the bag tube in various stages of completion. Fig. 17 is a plan view of the cloth applying device; Fig. 18 is an end view of the same, and Fig. 19 is a bottom view thereof. Fig. 20 is a detail

illustrating a step in the formation of the bag.

In the embodiment of the invention illustrated in the accompanying drawings the bag tubes are conveyed through the machine by means of rollers which are located between the end or valve forming devices, guides being provided for the bag end to hold or direct the same during the successive operations.

The frame of the machine is indicated at 1, and this is of proper size and shape to support the other parts as hereinafter described. The power for operating the various parts is supplied from a central drive gear indicated as a whole at 14 and connected to the various rollers and other parts by gearing or chain and sprocket mechanism. The conveying rollers, particularly, are driven by a succession of sprocket chains 3, acting upon the lower members of the pairs of conveying rollers. The bag tube, as fed to the machine, is indicated in Figs. 12 and 13. It is received at each end under the guide rail 40, the end of the tube projecting through a channel or space between the guide rail 40 and the rail 52. These rails extend the full length of the machine. The tube is conveyed in the machine by means of sets of upper and lower rolls 10, and which are carried by shafts 2 which are mounted in bearing boxes 30 movable up and down in housings 7 supported on the bed plate 12 of the machine and driven by the chain and sprocket gearing heretofore referred to. After reaching the first pair of rolls the bag tube passes between the suction boxes 23, which are located above and below the guides, and from which the air may be exhausted in any suitable manner. The suction boxes have perforations in their opposing opposite faces, and as the bag is passed between the same the sides of the bag tube are caused to separate. For spreading the sides so separated I provide a mechanism comprising a lever K connected at one end to a rod 22 which moves within a solid guide B and is fixed to a cross bar G and has at its extreme lower end a cross piece E. The cross piece G is recessed at its ends to receive the fingers F which extend therethrough, and said cross piece is normally held in raised position by the springs 21 connected thereto and to a frame H mounted on the frame of the machine. The fingers F are pivoted at their upper ends to the cross piece G. When the rod 22 and cross piece G are pushed down the fingers F are forced toward each other, and when the cross piece is lifted the fingers are swung out or apart. The lever K is connected to and operated by a rock shaft 38, which has other arms J and J', the former of which is connected by a rod 35 to an eccentric 35^a and the latter of which is con-

nected to a resisting spring O. By means of the eccentric the shaft is rocked at equal intervals. On the down stroke or depression of the rod 22 the cross piece E is forced downwardly and the fingers are swung inwardly, the cross piece E engaging and pressing down upon the upper separated sides of the bag tube and forcing it back over the plate or rail 40, so as to spread the bottom, and the intumed ends of the fingers press in and fold the V-shaped corners of the bag, as illustrated in Fig. 20. The springs 21 and O, referred to, serve to return the parts to the normal position.

In order that the feed of the tubes may be timed according to the operation of the said spreader the mechanism shown particularly in Fig. 6 is used. The upper roll of the first set of rolls 10 is carried at each end by a lever 8, which is fulcrumed under a cross piece 55. The roll is carried between the front ends of these members and the rear ends thereof are acted upon by a cam 17 on a cross shaft 17^a suitably supported above the machine. The upper roller of the second pair of rolls is similarly carried by levers 9 which are acted upon oppositely to the first pair of rollers by means of cams 18 on the said shaft 17^a. By the operation of these cams and levers the rolls of the first and second pairs are alternately brought together and separated, so that a bag is first delivered from the first pair of rolls to the second and then remains stationary until it is delivered by the second pair of rolls to the succeeding devices; and so the feed is intermittent, the bag tubes being spaced apart and being advanced in succession, intermittently, through the machine. After passing the second pair of rolls the ends of the tube are creased by the creasing rollers 15, as indicated in Figs. 14 and 15, and passes thence between a pair of rolls 19 to the gluing and cloth feeding devices.

The glue pot is indicated at 25 and the glue-applying segment at 20, the glue roller being indicated at 20^a. The arm 20 imprints a strip of glue upon one corner of the bag end, for the purpose of securing the cloth which lines the valve.

The cloth feeding device is shown in Figs. 17, 18 and 19, wherein 33 is a drum or roller which incloses a roll of cloth 34. This drum and associated parts are mounted on the frame under the glue roller 20^a. This cloth is drawn through the slot 350 by means of rollers 360 actuated by gears 370 and 380 and adapted to the exact length of cloth required at each complete revolution of the drum. Cutter knife 410 acts once at each revolution to cut off the cloth, and the air passing through the apertures 430 leading through the wall of the drum into an exhaust chamber 440 to an exhaust pipe 450 serves to suck up and hold the cloth upon the

drum until it comes in contact with the glue on the bag tube. If no valve is required the cloth and cloth-applying device are dispensed with.

5 The pair of rolls following the gluing devices deliver the tube to the set of rolls 12^a, the top roll of which is depressed against the lower roll by a spring 23^b, the roll being supported in boxes 27^c carried by a bracket 70 depending from a cross plate 66 mounted on the sides of the frame of the machine. The sides of the flattened end of the tube are then bent upon the creases by means of a former 51, which positions the flaps in readiness to be successively lapped over each other by means of the adjustable turning devices 24^a and 25^b, the first device turning over one side and the second device turning the other side over upon the first and bringing the glued parts together. The tube then passes between the pressure rollers 11^c, which flatten and securely hold the flaps together. During its whole travel through the machine each end of the tube travels upon the longitudinal plate or rail 52 and underneath the longitudinal guide rail 40. The rails 40 are supported by bolts 19^e which depend through slots in cross pieces 57, whereby said guide rails may be moved closer to or farther from each other to accommodate bags of different lengths. The formers 51 are supported by bolts 70^a depending through slots in cross plates 66^a, whereby said formers may be placed closer together or farther apart. The rails 52 are supported by adjustable frames 52^a which are connected at opposite ends by right and left screws 80 which can be turned by the hand wheels thereon to draw said rails 52 closer together or force them farther apart. The glue pot and its rollers are supported by standards 32 on the frame. The various parts operate in succession on the tubes as they pass therethrough.

Various modifications of the details may be provided, particularly with respect to the feeding or conveying mechanism, the power transmitting devices, and the spreading or folding devices, without departing from the principle or scope of the invention.

50 I claim:

1. In an automatic machine for putting duplicate satchel ends upon a valve bag tube, the combination 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.

2. In a bag machine, in combination, means to convey a bag tube through the machine, comprising upper and lower rollers, and duplicate guides for opposite ends of the tube, and duplicate bag bottom or end-forming means arranged to act upon both ends of the tube as it is conveyed through the machine, said end-forming means being adjustable toward or from each other, to act upon tubes of different lengths.

3. In a bag forming mechanism, in combination, conveying and guiding devices for a bag tube, suction devices between which the end of the bag tube is conveyed, adapted to separate the sides of the tube, and a vertically-reciprocating plate adapted to press down upon said end and fold back one of said sides upon said guiding device.

4. In a bag forming mechanism, in combination, parallel guide rails adapted to support opposite ends of a bag tube, means to feed said tube along said rails, upper and lower suction devices on opposite sides of said rails and adapted to separate the sides of said tube at both ends, a vertically movable plate arranged to act upon the end of the tube when so separated and fold one side thereof back over the guide rail, and opposite laterally-swinging fingers beside the ends of said plate and arranged to press down folds at the ends of the bag bottom.

5. In a bag machine, in combination, duplicate sets of bag end-forming and making mechanisms, arranged beside each other and adapted to act upon opposite ends of the same tubes, and means to feed tubes successively through the machine between said mechanisms, including a series of upper and lower rollers between which the tubes pass.

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

JOHN ROGERS.

Witnesses:

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JOHN A. BOMMARDT.