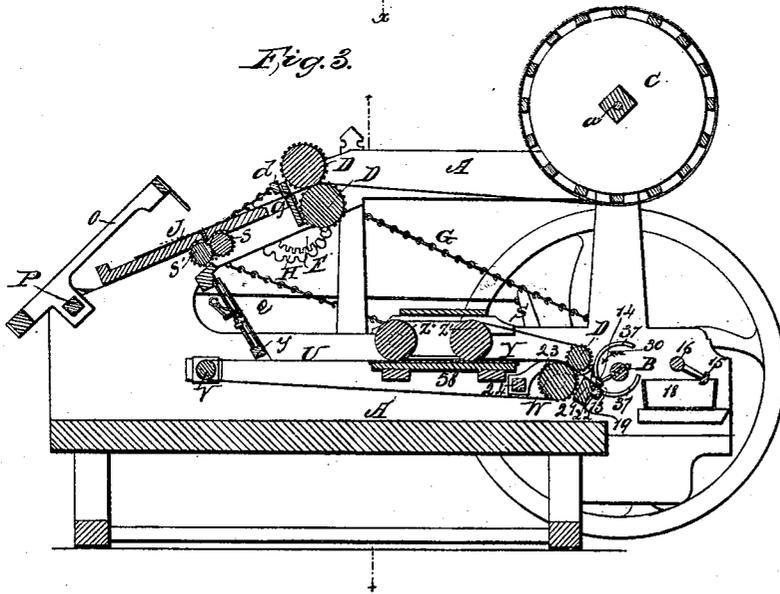
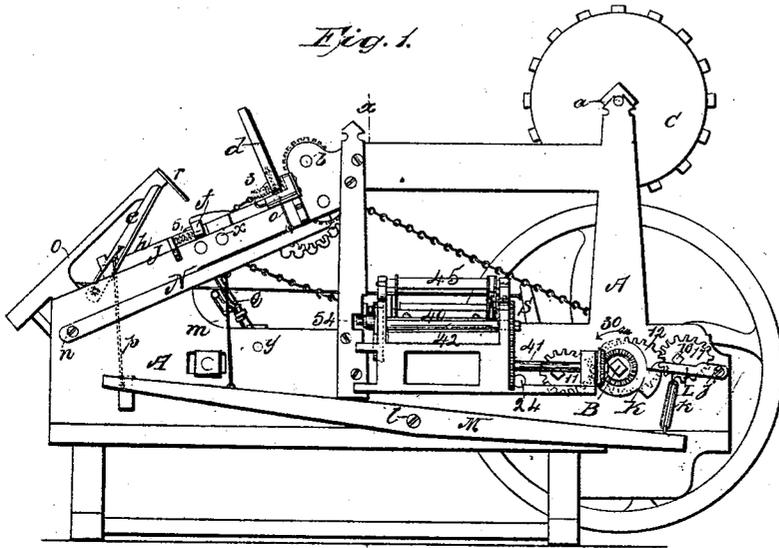


F. WOLLE.  
PAPER BAG MACHINE.

No. 9,355.

Patented Oct. 26, 1852.



F. WOLLE.  
PAPER BAG MACHINE.

No. 9,355.

Patented Oct. 26. 1852.

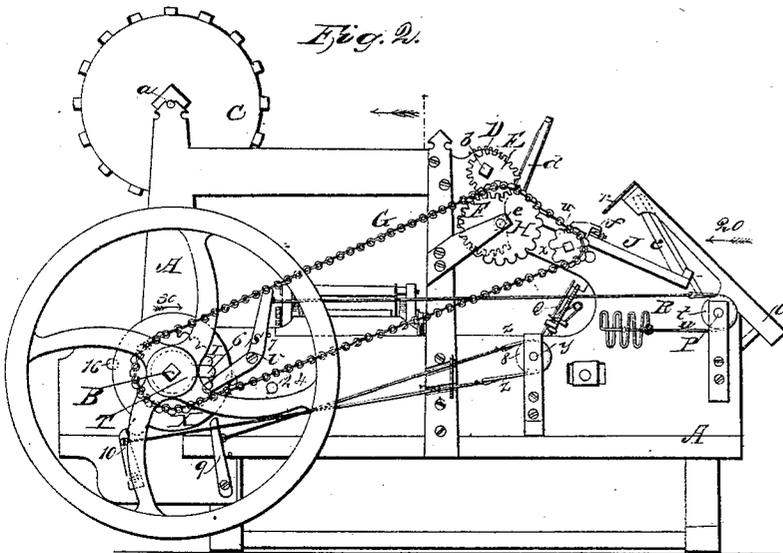


Fig. 2.

Fig. 4.

Fig. 6.

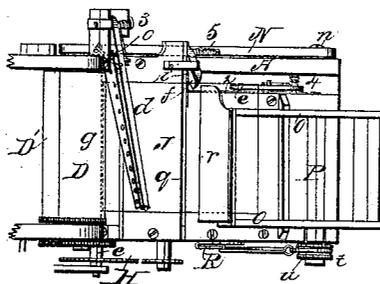
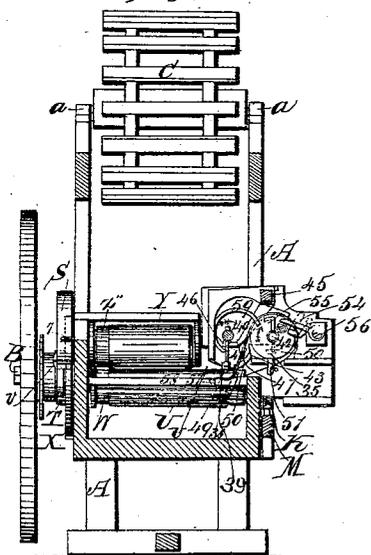


Fig. 7.



Fig. 9.

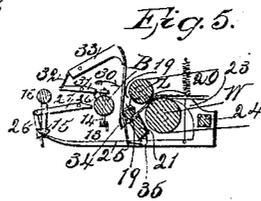
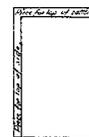


Fig. 5.

Fig. 8.



# UNITED STATES PATENT OFFICE.

FRANCIS WOLLE, OF BETHLEHEM, PENNSYLVANIA.

## MACHINE FOR MAKING BAGS OF PAPER.

Specification of Letters Patent No. 9,355, dated October 26, 1852.

To all whom it may concern:

Be it known that I, FRANCIS WOLLE, of Bethlehem, in the county of Northampton and State of Pennsylvania, have invented a new and useful Machine for Making Bags of Paper or other Material; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming part of this specification, in which—

Figures 1 and 2 are elevations of opposite sides of the machine. Fig. 3, is a longitudinal vertical section of the same looking in the same direction as in Fig. 1. Fig. 4, is a transverse vertical section of the same in the line  $x x$  of Figs. 1, 2, and 3, looking in the direction of the arrow 20. Fig. 5, is a vertical section of the parts which lap and paste the side of the bags, taken in the same plane as Fig. 3, but looking in the opposite direction. Fig. 6, is a top view of the parts which measure out the paper, cut it from the roll, cut out a piece to leave the bottom lap, and fold it. Fig. 7, represents one of the pasters detached from the machine. Fig. 8, shows the shape of the piece of paper after it is cut out, and Fig. 9, exhibits the same folded.

Similar letters of reference indicate corresponding parts in each of the several figures.

This invention consists in certain devices by the combined operation of which pieces of paper of suitable length are given out from a roll of the required width, cut off from the roll and otherwise suitably cut to the required shape, folded, their edges pasted and lapped, and formed into complete and perfect bags which when dried will be ready for use.

To enable others to make and use my invention I will proceed to describe the several parts in detail, and the manner in which their operation is conducted.

The working parts are all supported by a framing A, A, of suitable materials form, strength, and dimensions, all their movements being derived from the main shaft B, to which a continuous rotary motion is given by any suitable means in the direction of the arrow 30. The paper from which the bags are made which is represented in red color in the drawing, is in a roll of a width suited to the depth of the bags, and is wound upon a reel C, whose axis  $a$  turns

freely in suitable bearings in the upper part of the framing near one end of the machine. One end is led between the two taking off cylinders D, D', which receive an intermittent rotary motion, being caused to make one revolution and then stop for a short time previous to making their next revolution. These rollers are of such diameter that one revolution will unwind from the reel a sufficient length of the roll of paper to make both sides of the bag and allow a piece for the lap of the joint; they receive their motion (see Fig. 2) through an oval cog wheel E, which is fast on the axis  $b$ , of D, and is driven by an eccentric wheel F, of segmental form on a shaft  $c$ , which receives motion through an endless chain G, passing over a chain wheel H, fast upon it, and around a chain wheel I, of corresponding size on the driving shaft. The chain gives a continuous motion to the shaft  $c$ , but the wheel F having no teeth on the part forming the chord of the segment ceases to give motion to E, while that part of its circumference is passing, thus the cylinders D, D', stop their revolution while the teeth of E, and F, are out of gear, but the teeth of F, being equal in number to those of E, always give it one complete revolution between the stoppages. The cylinders are geared together so as to revolve at the same speed in opposite directions.

The paper drawn through or between the cylinder D, D' lays upon an inclined plane or table J, on the upper part of the framing, near the opposite end to the reel C, and as soon as the cylinders have performed a revolution and delivered the paper for a bag and become stationary, the three shear arms  $d$ ,  $e$ ,  $f$ , come into operation,  $d$ , cutting off the piece from the roll, and  $e$ , and  $f$ , cutting away part of one edge so that the remaining part of the same edge can, when the piece is doubled,—be lapped over it to make the joint or seam in the bottom of the bag.

The form of the piece after it is cut is shown in red lines in Fig. 6, the lines 1, 2 showing the form of the piece cut out by  $e$ , and  $f$ . To show the form more distinctly the Fig. 8, is given, the dotted lines showing the part cut out. The shear  $d$ , hangs on a pin 3, and cuts on the edge of a bar  $g$ , in front of the feed rollers (see Fig. 3, and dotted lines in Fig. 6);  $e$ , hangs on a pin 4, and cuts on the side edge  $h$ , of the lower part of the inclined plane J, which is made nar-

rower than the upper part, and *f* hangs on a pin 5, and cuts on the edge of a strip of steel *i*, standing out at a right angle to the edge *h*, meeting the said edge *h*, where the point of the shear *e*, meets it in cutting. The edge *g*, and the edge *h*, are steeled and the shears *d*, *e*, *f*, may be steel bars, or wooden or iron bars having a strip of steel secured to them. The shears are caused to descend and make their cuts by means of a cam K, on the driving shaft B, which, once during every revolution of the shaft comes into operation under and raises a short lever L, hung on a fulcrum *j*, in the side of the framing; this lever L, is connected by a strap or link *k*, to one arm of a long lever M, which hangs on a fulcrum *l*, in the framing, the other arm of the said lever connecting by a rod *m*, with another lever N, on a fulcrum *n*, and the said lever N, connecting by a rod *o*, with the shear *d*, the lever M, is connected also by a rod *p*, to the shear *e*; by the action of the cam K, on the lever L, the shear *d*, and *e*, are brought down past the edges *g*, and *h*, and as *e*, descends its end (being suitably formed for the purpose) presses on the end of *f*, and forces it down past the edge of *i*, thus it will be seen that all the shears operate at the same time: they are all raised by springs attached to each, after the projection of the cam K, which operates on the lever L, has passed the lever and ceased to operate upon it.

The piece of paper is now supposed to be cut out in the proper form for the bags; the next operation is that of folding it, by referring to Figs. 3, and 6, it will be seen that there is a narrow slot *q*, extending across the inclined plane J, dividing it into two parts, in line with the point where the shears *e* and *f*, meet, above the inclined plane there is a frame O, which vibrates on a shaft P, and which carries at its upper end a blade *r*, having a blunt edge which is caused by the descent of the frame to pass through the slot *q*. The slot *q*, is at such a distance from the line where the sheet is cut off by the shear *e*, as to make the part of the piece or sheet of paper above the slot so much longer or deeper than the part below it, as is required for the width of the lap for the side of the bag. By the descent of the frame O, the blade *r*, which I will term the folding creaser, creases the sheet and folds it as it drives it through the slot, rising as soon as it has driven the fold through. The fold is seized between a pair of cylinders *s*, *s'*, which revolve continuously and the folded sheet passes between them (see dotted lines in Fig. 3) and is deposited by them upon a flier Q. The folding creaser is caused to descend after the cutting off and cutting out of the sheet, by means of a strap *u*, passing over a pulley *t*, on the shaft P, the said strap being secured to the periphery of the pulley,

and one of its ends being connected to a spring R, secured to the side of the framing, the other end being connected to the upper end of a lever S, which hangs on a fulcrum *v*, in the framing. The lower end of the said lever S, is moved once during every revolution of the driving shaft B, by a projection 6, on the cam T, on the said shaft, which causes the upper end to pull on the strap *w*, and turn the pulley in the proper direction to bring down the creaser which is caused to ascend again as soon as the projection 6, passes the lever S, by means of the spring R, which pulls back the strap. The lever S, when the cam is not in operation on it, rests against a pin 7, in the side of the framing. The cylinders S, S', receive their revolution through the endless chain G, which passes over a chain wheel *w*, on the axes *x* of S, the cylinders being geared together by spur wheels.

The flier Q, is a light frame of sufficient size for the sheet to lay upon, it is unnecessary to describe its construction as it might be made in different ways. It is sufficient to say that it rocks upon a shaft *y*, which rests in bearings in the sides of the framing. When it is at rest it occupies an inclined position as shown in Figs. 1, 2, 3, and it is in this position when the paper is deposited upon it by the cylinders *s*, *s'*. As soon as it receives the paper it turns over and deposits it upon the endless apron U, which runs around two rollers V, and W; and instantly resumes its former position. The movement of the flier is effected by means of a strap *z*, which passes around and is secured to a pulley 8, on one end of its shaft *y*, (see Fig. 2,) the ends of this strap are connected to two levers 9, and 10, which are operated upon by a cam X, on the driving shaft once during every revolution; it is turned over by the cam acting on the lever 9, and returned to its stationary position by the cam acting on 10, immediately after. In the drawing it is supposed to be just raised ready to receive the paper, the cam just ceasing to operate upon 10.

The endless apron U, carries the paper to the pasting and lapping apparatus; the bottom of the bag being first pasted and lapped and the side being afterward pasted and lapped. The bottom pasting apparatus is at the side, and the side pasting apparatus at the end of the machine. The operation of that which pastes the side will I think be most readily understood, I will describe that first, although it does not come into operation till after the others; before doing this I will however explain the carrying apparatus.

As the apron U, carries the paper along it brings it under another endless apron Y, which runs on three rollers Z, Z', Z''. Between the two aprons the paper is held in a

fixed position for lapping and pasting. The aprons receive motion both together at proper intervals by means of an oval cog wheel 11, on the axis of the roller W, which gears into a toothed wheel 12, on the driving shaft. The wheel 12, is in the form of an ellipse with a segment cut off, the part forming the chord of the segment having no teeth, so that while that is passing the wheel 11, it does not give motion to it. The two cog wheels are so arranged that they give motion to the roller W, at the proper time to move the apron, the said roller W, being geared with the roller Z, causes the two aprons to move together. In the drawings the aprons are supposed to be at rest with a piece presented to each pasting and lapping apparatus.

The side pasting and lapping apparatus shown in Figs. 3, and 5, consists of the paster, creaser, lapper, paste feeder and paste trough. The paster consists of a brush 13, or piece of leather attached to a strip of wood of sufficient length to paste the whole length, of the lap at once, attached by two arms 14, to the main shaft B; it revolves and once during every revolution comes into contact with the paste feeder 15, and is supplied with paste. The feeder consists of a bar attached by arms to a shaft 16, which is parallel with the shaft B, and is driven by an oval toothed wheel 17, gearing into the wheel 12, on B; it is caused to revolve through the paste in the trough 18, and collect sufficient paste to supply the paster as they pass each other revolving in opposite directions. The lapper consists of a bar of wood or metal 19, which is hinged to a stationary bar 21, running across the framing and must be at least as long as the bag; it lays flush with the upper part of the said bar 21, as shown in Fig. 3, and is stationary except while it makes the lap when it folds over on to the top of 21, as shown in Fig. 5. The paper is deposited by the aprons with the part forming the lap on the top of the lapper as shown in Fig. 3, and while it is in this position the paster in-passing pastes it; and immediately after this the creaser which consists of a long blade 22, attached by arms 23, to a vibrating shaft 24, comes down upon the line where the lapping commences, which is close to the edge of the upper side of the bag, and holds it while the lapper turns over. The creaser is however withdrawn in time to escape the lapper, which turns the pasted lap over the edge of the upper part of the bag and then turns back again to allow the bag to be thrown out of the machine by the following movement of the aprons. The creaser is operated by means of a long lever 25, attached to one end of its shaft (see Fig. 5.) which is depressed by a rod 26, attached to one end of another lever 27, hung above it on a ful-

crum in the side of the framing, the opposite end of the said lever 27, being raised by a stud 28, on the shaft B, once during every revolution of the shaft.

The creaser is raised when the stud 28, has passed the lever 27, by a spring 29, attached to the lever 25, and to the side of the frame. The lapper is turned over to make the lap through the agency of the same stud 28, which actuates the creaser, the said stud raising one end of a lever 31, hung on a fulcrum on the side of the framing, the opposite end of the said lever 31, being connected by a link 32, with the shorter arm of a lever 33, which also works on a fulcrum secured in the side of the framing, the longer arm of the said lever 33, having a strap attached which passes around a semi-circular tumbler 34, attached to the lapper, and which by being raised turns over the lapper, which is returned down or back again after the stud passes the lever 31, by a spring 35, which is placed under the stationary bar 21, and connected to the lapper by a cord or strap. The paster 13, instead of being secured immovably to the shaft B, is movable; the arms 14, being allowed to slide through holes in the shaft, and having nuts on their back ends to prevent their drawing out. Springs 36, (see Fig. 7,) are placed between the shaft and paster to keep it out from the shaft. This arrangement is for the purpose of allowing the brush to be drawn toward the shaft at certain parts of its revolution to prevent pasting the apron and to make it clear the edge of the paste trough; the drawing in being effected by eccentric ways 37, which are stationary on the framing, and inside which the ends of the paster pass as it revolves.

To return to the bottom pasting and lapping apparatus at the side of the machine—I will first remark that it is essentially the same as that which laps and pastes the side of the bag, but its position requires it to be operated by different means, which will be best understood by referring to Fig. 4. The lapper 38, is similar to the other one, and is hinged to the side of a stationary table 58, which is immediately under the two aprons, and under the rollers Z', Z'', to this point one bag is brought every time the aprons become stationary and the pasting and lapping apparatuses come into operation. The edge of the apron is just over the hinge or joint of the lapper and that part of the bottom side of the folded paper which forms the lap overhangs the edge of the apron. The apron Y, is narrower than that U, to make room for the bottom pasting apparatus. The paster 39, which is placed parallel with the movement of the apron, is attached to a shaft 40, in a similar manner to the other; this shaft 40, has a constant revolution which it receives through spur gear-

ing from a counter shaft 41, (see Fig. 1,) which is driven by bevel gearing from the main driving shaft B. The paste feeder 60, is attached to the shaft 42, which is driven  
 5 by part of the same train of gearing and feeds the paster from the trough 43. The paster is drawn toward the shaft during its revolution to make it clear the apron and  
 10 trough, by eccentric ways 59, on the framing. The creaser 44, is hung on a vibrating shaft 45, and is depressed by a stud 46, on the paster shaft 40, which actuates a lever 47, on the creaser shaft. It is raised by a  
 15 spring 52, attached to the framing. The lapper 38, is turned over to make the lap by a strap 48, which passes around a semi-circular tumbler 49, on the end of the lapper.  
 20 The other end of the said strap passes partly around and is attached to a tumbler 50, which fits loosely upon one end of the feeder shaft 42. This tumbler 50, is in the form of a circle with a projection 51, standing out from a part of its periphery. On  
 25 the face of the tumbler there is a stud 53, upon which rests the end of a lever 54, which hangs on a pin 56, secured in the framing. This lever has two arms which are nearly side by side, the one resting on the stud, and the other arm which is bent  
 30 slightly downward from it, being operated upon by a tappet 55, on the feeder shaft 42. This tappet at the proper time for turning over the lapper, presses down the lever 54, which pressing on the stud 53, causes the  
 35 tumbler to turn a short distance and by pulling on the strap 48, to raise and turn over the lapper to fold over the lap.

The tappet 55, is of such length that as soon as the lapper is turned over and the  
 40 lap made it passes the lever 44, and leaves the lapper free to be pulled down again by a strap which is attached to a spring 57, below the table 58, the return of the lapper pulling on the strap 48, draws back the tum-  
 45 bler 50. The projection 51, on the periphery of the tumbler is for the purpose of pulling on the strap 48, in a direction more favorable to the turning over of the lapper.

The machine turns out one finished bag at  
 50 every revolution of the main shaft, but there are four bags always in it under different stages of the manufacture. At the time one is being cut out, a second is being placed upon the apron, a third is pasted at the end,  
 55 and a fourth at the side; each succeeding

revolution of the machine finishing and throwing out one bag, commencing one and bringing three others to a more advanced stage of the operation. The machine may be  
 60 driven at the rate of thirty revolutions a minute which would make eighteen hundred bags per hour.

The width of the bags may be varied by changing the cylinders D, D', and by moving the inclined plane J, so as to bring the  
 65 slot *g*, nearer to the cylinders D, D'. The shears and folding creaser may be all movable with the inclined plane so that their correct operation may be always insured.

The machine is susceptible of various  
 70 changes in the arrangement of the parts; for instance, the folding apparatus and shears for cutting out the piece to leave the bottom lap may be placed at right angles to their  
 75 present position and the width of the bags may be regulated by the width of the paper, and the depth by the quantity given out by the cylinder.

What I claim as my invention and desire to secure by Letters Patent, is— 80

1. Giving the proper form to the piece of paper or material from which the bag is to be made, by means of the shears *e*, and *f*, which cut on the edges of or on edges attached to the stationary table or inclined  
 85 plane J, on which the paper is delivered, and cut out a rectangular piece, as shown in Figs. 6, and 8, from that part which is to form one side of the bag, so as to leave a lapping piece on the part which is to form  
 90 the other side of the bag, as herein substantially set forth.

2. The pasters 13, and 39, in combination substantially as described with the feeders 15, and 60, which revolve or pass through  
 95 the paste and supply them with a proper quantity for pasting each lap.

3. The combination of the creasers 22, and 44, and the lappers 19, and 38, with the intermittingly moving feed rollers W, Z, and  
 100 aprons U, Y, in the manner substantially as described the said creasers and lappers being brought successively into operation on the bags during the intermissions in the motion of the feed rollers as set forth.

FRANCIS WOLLE.

Witnesses:

JACOB WOLLE,  
 GEDIDIAH HEISS.