(No Model.)

2 Sheets—Sheet 1.

J. H. SMITH & M. D. KNOWLTON.

MACHINE FOR THE MANUFACTURE OF FLY PAPER.

No. 491,861. Patented Feb. 14, 1893.

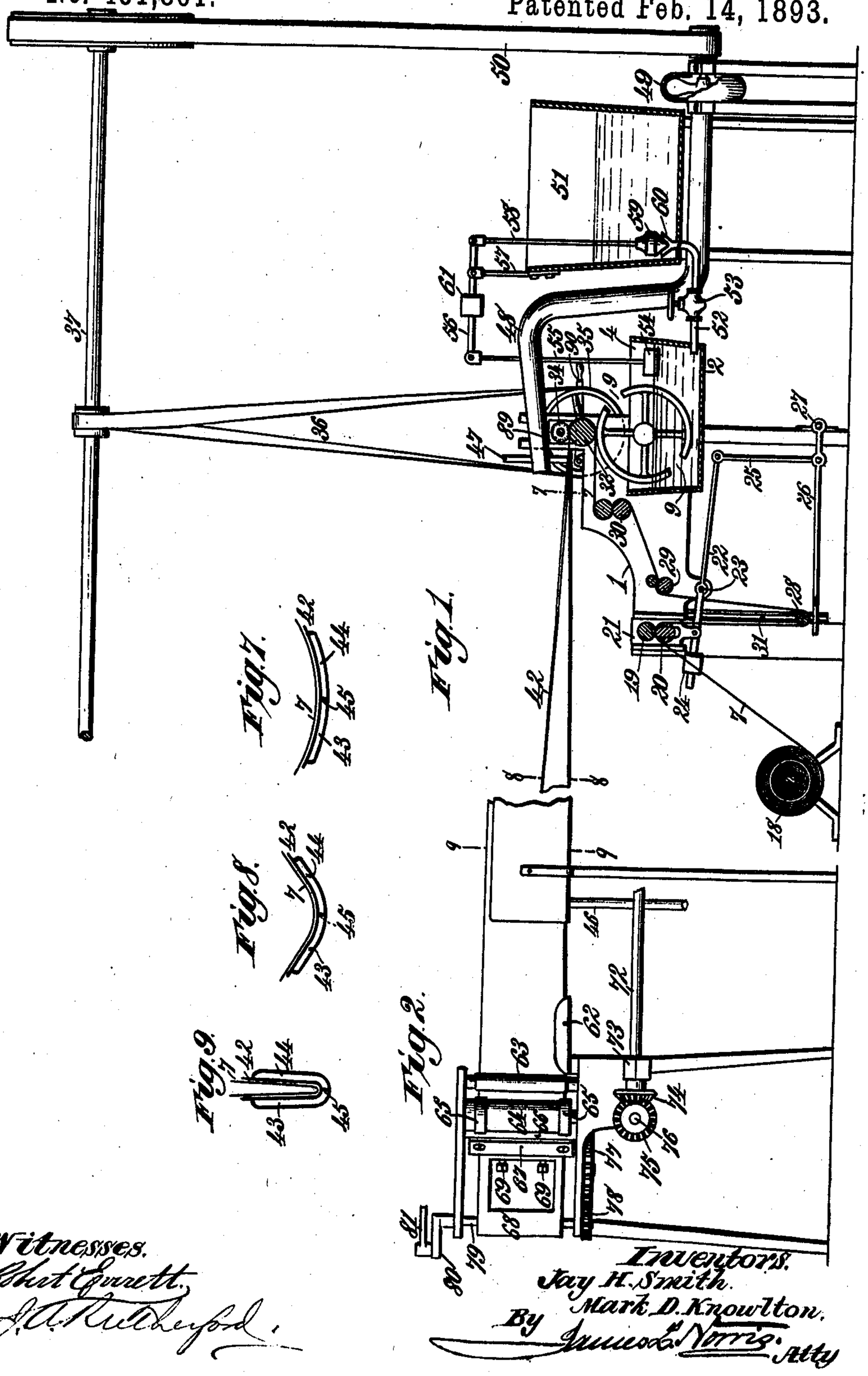

Fig. 1.

Fig. 7.

Fig. 8.

Fig. 9.

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(No Model.)

2 Sheets—Sheet 2.

J. H. SMITH & M. D. KNOWLTON.

MACHINE FOR THE MANUFACTURE OF FLY PAPER.

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Fig. 3.

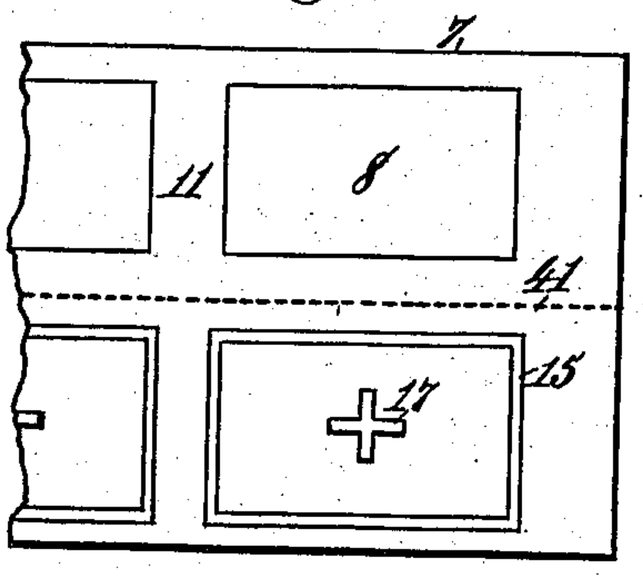


Fig. 4.

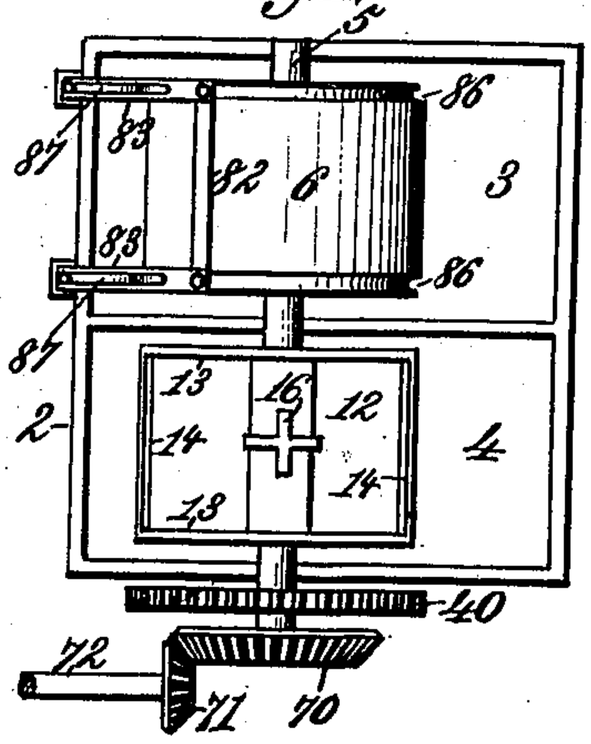


Fig. 5.

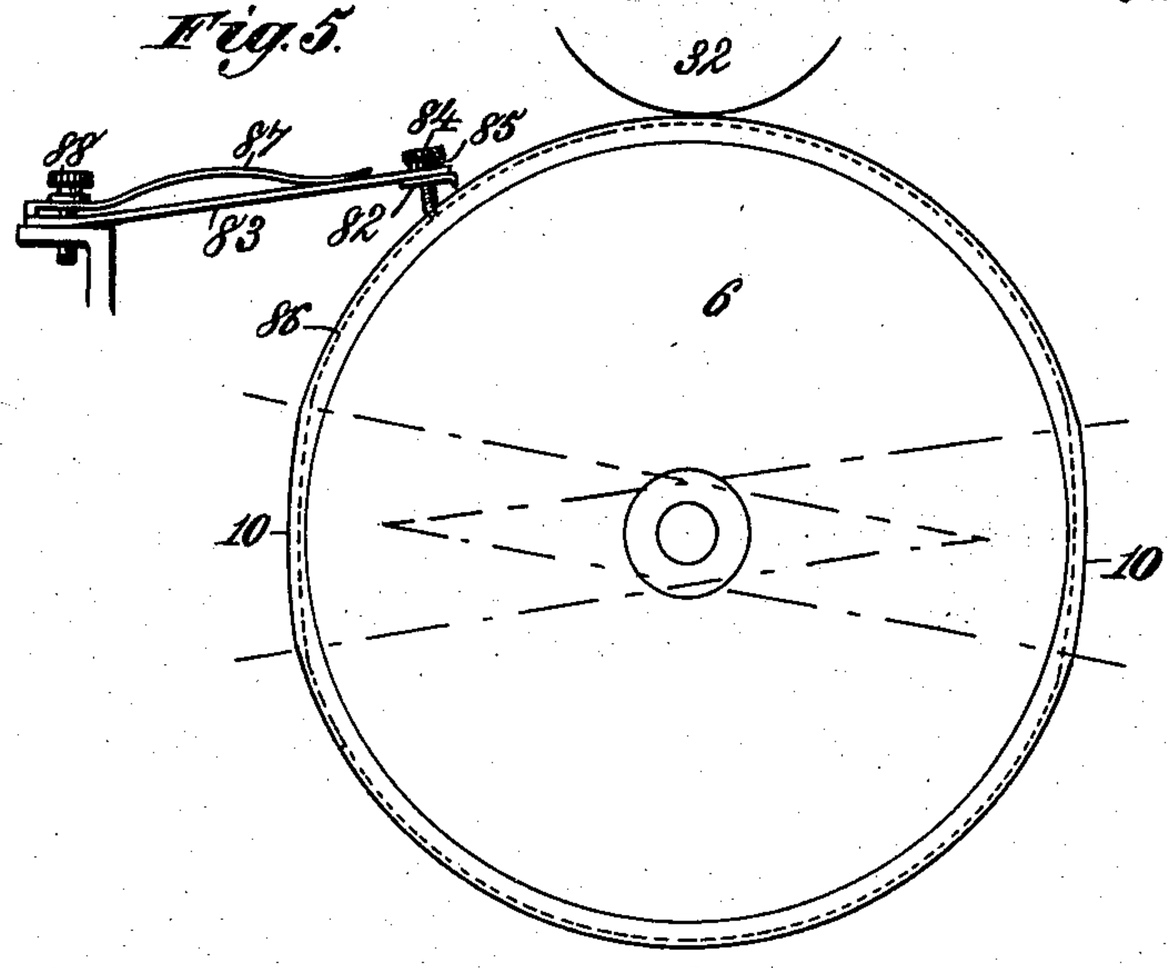


Fig. 6.

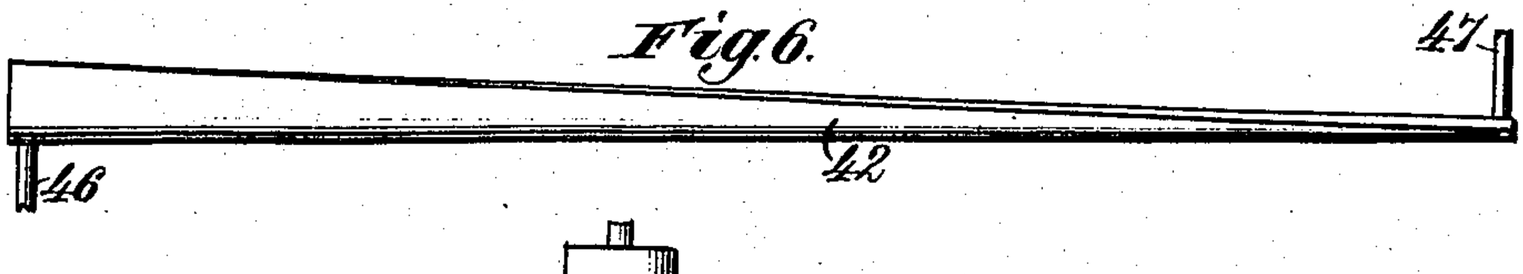
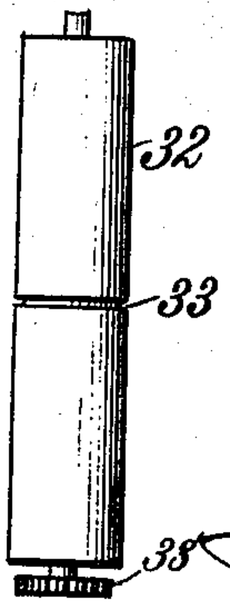


Fig. 10.



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UNITED STATES PATENT OFFICE.

JAY HUNGERFORD SMITH AND MARK DEAN KNOWLTON, OF ROCHESTER, NEW YORK; SAID KNOWLTON ASSIGNOR TO SAID SMITH.

MACHINE FOR THE MANUFACTURE OF FLY-PAPER.

SPECIFICATION forming part of Letters Patent No. 491,861, dated February 14, 1893.

Application filed October 29, 1892. Serial No. 450,369. (No model.)

To all whom it may concern:

Be it known that we, JAY HUNGERFORD SMITH and MARK DEAN KNOWLTON, citizens of the United States, residing at Rochester, in the county of Monroe and State of New York, have invented new and useful Improvements in Machines for the Manufacture of Fly-Paper, of which the following is a specification.

This invention relates to machines for manufacturing sticky fly paper from a continuous sheet or strip of paper in the form of a roll, and it embraces mechanisms that are especially adapted for producing a sticky fly paper of the character described in Letters Patent No. 476,087 granted to Jay Hungerford Smith, May 31, 1892.

Our invention comprises a machine provided with mechanism for automatically controlling the slack and equalizing the feed of a strip of paper to the point where the sticky coating material is applied; a tank provided with parallel compartments for containing the coating material, the contents of one compartment being preferably more adhesive than the other for a purpose hereinafter explained; rotary drums of peculiar construction mounted in said tank compartments and rigidly connected with each other for the purpose of properly applying to one side of the paper strip, on opposite sides of its median line, coatings of different adhesiveness or consistency one of which is adapted to form the field of the fly paper and the other a thickened margin registering with and surrounding said field, said coatings being mutually transferred from one side of the paper to the other when the paper is folded along its median line; means for perforating the paper lengthwise in a central line to facilitate its folding and its subsequent separation when required for use; devices for cooling the adhesive coatings after they have been applied to the paper and for relatively controlling their temperature; mechanism for folding the coated paper strip longitudinally; and means for severing the coated and folded strip of paper into suitable lengths for the trade.

The invention consists in the peculiar features of construction and novel combinations of parts in machinery for the manufacture of sticky fly paper, as hereinafter more particularly described and claimed.

In the annexed drawings illustrating the invention—Figure 1 is a sectional side elevation of one end of our improved machine for making sticky fly paper. Fig. 2 is a side elevation of the other end of said machine. Fig. 3 represents a portion of a strip of paper after it has been coated and perforated but before it is folded. Fig. 4 is a plan of the tank having two parallel compartments for containing the coating material and the rotary drums by which said material is applied to the paper. Fig. 5 is an enlarged end elevation of a form of rotary drum for applying coating material to a strip of paper, the said drum being provided at intervals with substantially flat surfaces corresponding with the position of the uncoated margins or intervals between the sheets or sections of fly paper. Fig. 6 is a side elevation of the cooling trough or water jacket for controlling the temperature of the paper after it has been coated. Figs. 7, 8 and 9 are vertical transverse sections of the cooling trough and contained paper strip on the lines 7, 8 and 9, respectively, of Figs. 1 and 2. Fig. 10 is a view of a grooved roller.

Referring to Fig. 1, the numeral 1 designates the frame of the machine near one end of which is suitably supported a tank 2 having a partition dividing it into parallel compartments 3 and 4, Fig. 4, adapted to contain a glutinous or adhesive coating material of any suitable nature such as is commonly used in the manufacture of sticky fly paper.

In manufacturing a sticky fly paper having a field of less adhesive substance surrounded by a margin or border of more adhesive material, as described in the before described Letters Patent No. 476,087 dated May 31, 1892, we place in the tank compartment 3 the less adhesive substance for composing the field and in the tank compartment 4 we place the more adhesive or thicker material for composing the slightly raised and adhering border of the fly paper. At a suitable point in the tank 2 is journaled a transversely arranged rotary shaft 5 which is extended through both compartments of the tank as shown in Fig. 4. Secured to this shaft 5,

near one end, is a drum 6 that is arranged to be rotated in the body of adhesive material contained in the tank compartment 3 and is so constructed as to be capable of applying to the strip of paper 7 that portion of the coating which is to form the field 8 as shown in Fig. 3. The periphery of the drum 6 may be provided at opposite points with gaps 9, as shown in Fig. 1, or with substantially flat surfaces 10, Fig. 5, disposed at suitable intervals to prevent contact of the drum, at those points, with the moving strip of paper and so provide for leaving uncoated the spaces 11, Fig. 3, between adjacent sections of the fly paper. As in some cases the gaps 9 are objectionable by causing a churning action of the drum 6 in the adhesive material, and the mixture of air therewith, we prefer to flatten or slightly reduce the diameter of the drum at the required points, as 10, Fig. 5, to correspond with the uncoated intervals to be left on the strip of fly paper. These flattened or reduced portions 10 need not be recessed into the body of the drum, as the shoulders thus produced would be objectionable, but as indicated by dotted lines in Fig. 5, said flattened portions 10 of the drum periphery may each correspond to segments of a much larger circle than is formed by the main body of the drum. Secured to the shaft 5, in position to be revolved in the tank compartment 4, is a drum 12 which comprises annular ribs 13 connected at suitable intervals by cross-bars or transverse ribs 14, Fig. 4; said annular and transverse ribs being so arranged as to be capable of taking up the sticky material in the tank compartment 4 and applying it to the paper strip 7 in such manner as to form on one side of the median line of said paper a rectangular border 15, as shown in Fig. 3. The drum 12 may also carry a star or cross shaped projection 16 in position to apply a correspondingly shaped surface 17, Fig. 3 of thickened adhesive material to the paper 7 in the center of the border 15 formed by the annular and transversely ribbed portions of said drum. It will be understood that when the paper strip 7 is folded along its median line the series of fields 8 will each register with a corresponding border 15 and cross or star shaped center piece 17 so that by mutual transfer of the sticky material on opposite sides of the median line the said paper will be provided with a double series of fields 8 each provided with a surrounding border 15 and inclosing a center 17, the said fields being less sticky than their borders. Both drums 6 and 12 are preferably made with solid ends so that there is no possibility of the sticky substance entering the inside of the field drum 6 nor through either head of the border drum 12.

The continuous paper strip 7, to be coated with adhesive material in the manner above described, is supported, in the form of a roll, on a reel 18, Fig. 1, from which it is gradually drawn off by feed rollers 19 and 20 that can be driven in any convenient or suitable manner. The lower feed roller 20 is journaled in suitable bearings provided in the frame of the machine while the upper feed roller 19 is journaled at each end in a yoke 21 having its lower end pivotally attached to a lever 22 that is fulcrumed at 23 to one side of the machine frame. Each yoke 21 surrounds one end of the lower feed roller 20 and is supported by a separate lever 22. On the short arm of each lever 22 is a weight 24 by which the levers are counterpoised. The long arm of each lever 22 is connected by a link 25 to a lever 26 fulcrumed at 27 to the lower part of the machine frame. From the feed rollers 19 and 20 the paper strip 7 passes beneath a vertically movable sag roller 28 and between friction rollers 29 to the auxiliary feed rollers 30 which may be driven by any suitable means. It is essential that as the paper strip travels toward the coating apparatus it shall be quite flexible in order to insure its perfect lateral guidance. This is accomplished by the action of the sag roller 28 operating upon the compound system of levers 26, 25, 22 to automatically control the tension and feed of the paper and thereby govern or equalize its flexibility. Ordinarily the weight of the sag roller 28 resting in the loop of the paper strip between the feed rollers 19, 20, and guide rollers 29 will be sufficient to give the required tension to the paper and cause it to be fed evenly. Should the feed rollers 19 and 20 draw the paper from the reel faster than the auxiliary feed rollers 30 take it up, the sag roller 28 will drop on to and depress the long arms of the levers 26 which through the links 25 will draw down the long arms of the levers 22 and thereby cause the yokes 21 to raise the upper feed roller 19 from its engagement with the lower feed roller 20; thus stopping the feed from the reel until the rollers 30 catch up the slack and lift the sag roller 28, when the upper feed roller 19 will drop on to the lower feed roller 20 and cause the feed of paper from the reel 18 to be resumed. It will thus be seen that by means of this mechanism a perfectly automatic feed and tension of the paper strip are maintained.

If desired the frame of the machine may be provided with a vertical slotted guideway 31 for the ends of the sag roller.

From the automatic feed and tension mechanism above described the paper strip 7 is carried around a roller 32 that is supported in suitable bearings in the upper part of the machine frame immediately above the coating drums. Above an annular groove 33 formed in the central portion of the roller 32 is arranged a perforating wheel 34 mounted on a shaft that is supported in the same bearings with said roller. On the shaft of the roller 32 is secured a band pulley 35 through which said roller is rotated by means of belting 36 from a countershaft 37, as shown. The shaft of the roller 32 also carries a spur gear

38 which meshes with a spur gear 40 on the shaft 5 of the coating drums, thereby imparting power to the coating devices. By means of an eccentric lever mechanism (not shown) similar to that employed in throwing an engine lathe out of gear, the machine may be stopped and started at will.

In passing between the roller 32 and the coating drums 6 and 12 the strip of paper is supplied with coating material to form the fields 8, borders 15 and center pieces 17, disposed in the manner shown in Fig. 3, as already described. The coated paper strip 7 then passes over the roller 32 and beneath the perforating wheel 34 thereby receiving a longitudinal series of perforations 41, Fig. 3, in its median line. The perforating wheel 34 operates in line with the annular groove 33 formed in the roller 32 and may be of any suitable construction adapted to produce the required perforations in the paper strip.

From the roller 32 and perforating wheel 34 the coated and perforated strip of paper is passed into the shallow and comparatively flat end of a concaved cooling trough 42, Figs. 1, 2, 6, 7, 8 and 9. This cooling trough is preferably constructed with double metal walls in the form of a water jacket that is divided into two compartments 43 and 44 by means of a longitudinal partition 45 at the bottom, as shown in Figs. 7, 8 and 9. By this means the water in the two compartments 43 and 44 can be maintained at different temperatures according to the different degrees of adhesiveness or consistency required in the coatings on the two sides of the paper strip. Each compartment of the water jacket may be provided with an inlet pipe 46, Fig. 6, at one end and an outlet pipe 47 at the other end by which a continuous flow of water, at any temperature, can be obtained. It will be observed that the water jacket or cooling trough 42 is comparatively shallow and wide at its outlet end, as shown in Figs. 1, 6 and 7, and that it is gradually increased in depth and decreased in width toward its inlet end, as shown in Figs. 2, 6, 8 and 9, thus causing the opposite edges of the paper strip to approach each other as said strip is carried forward through the trough.

To facilitate the cooling of the coated paper strip we may direct a current of air onto its coated surface from a pipe 48 through which the air is forced by a rotary fan 49 which may be driven by belting 50 from a pulley on the countershaft 37, as shown in Fig. 1.

As it is desirable that the sticky substance should be applied to the paper at a high temperature, by which the proper degree of consistency will be maintained to insure an even distribution of said substance, it becomes necessary to cool the substances to a certain extent before the opposite edges of the coated paper strip are folded together.

The tank compartments 3 and 4 are supplied with sticky substance from a supply tank, or supply tanks, 51 which may be heated by steam pipes, (not shown,) that can be also arranged to heat the tanks 3 and 4, in any well known manner. Thermometers may be placed in the tanks 3 and 4 to indicate the temperature of their contents, so that by any suitable means for controlling the heating of said tanks the sticky substance in each tank compartment can be maintained at the proper consistency. The supply tank 51 may communicate with each compartment of the coating tank 2 through a pipe 52 having a hand valve 53 by which the supply of sticky material can be entirely cut off at will. When the apparatus is in operation this hand valve 53 is to be opened. The height of the coating material in the tank compartments 3 and 4 may be automatically controlled by means of a float 54 immersed in the contents of each tank and connected by a rod 55 to one end of a lever 56 that is fulcrumed to a stud or standard 57 supported by the supply tank. To the other end of the lever 56 is attached a depending rod 58 which carries a conical ended valve 59 adapted to control the upturned funnel shaped end 60 of the connecting pipe 52 through which the sticky material is conducted from the supply tank to the coating tank. It will be seen that as the material is supplied to the coating tank 2 the float 54 will rise until the descent of the valve 59 closes the inlet end of the pipe 52; and that as the coating material is consumed the float will fall and thereby cause the valve 59 to rise and admit a further supply of material. By means of a sliding or adjustable weight 61 on the lever 56 the reciprocal movements of the float 54 and valve 59 can be readily controlled so as to maintain any required depth of material in the coating tank. By thus regulating the supply of material, providing for maintaining the sticky coating substances at proper relatively regulated temperatures, applying said substances while hot to a moving strip of paper and properly cooling the strip of coated paper before its opposite edges are folded together a large economy of time and labor is effected and the manufactured article can be turned out from the machine with great rapidity in readiness for the trade.

It will be seen that owing to the construction of the cooling trough 42 by which it is gradually increased in depth and diminished in width the current of air issuing from the pipe 48 onto the coated surface of the moving strip of paper will be to a large extent confined between the opposite sides of the trough and will thus be caused to exert a cooling effect on the coated surface of the paper throughout the length of the trough.

In passing through the trough 42 between its gradually approaching sides the opposite vertically projecting edges of the paper strip 7 are brought toward each other and the said strip of paper has imparted to it a fold on the central line of perforations 41, Fig. 3. From the trough 42 the partly folded lower or central portion of the paper strip passes between

two creasing plates 62 one of which is arranged on each side of the line of fold to insure the close folding of the paper directly in its line of perforations. The folded paper strip then passes between two vertical rollers 63, preferably composed of rubber, by which the opposite sides of the folded paper strips are matted together, thereby causing the fields 8 on one side and the thickened borders 15 of the other side to be mutually transferred so that, when opened, both sides of the coated paper will be alike. From the matting or transferring rollers 63 the folded paper strip is drawn between tension or feed rollers 64 having enlarged end portions 65 for the purpose of tightly holding the two marginal edges of the paper, and thereby feeding it along between two vertical plates or stationary cutters 66 to a revolving cut off knife 67 by which the paper strip is severed at proper intervals, through its uncoated transverse margins or spaces 11, Fig. 3 into doubled sheets suitable for the trade. The revolving knife or cutter 67 is carried by a rotary head 68 to which it may be attached by means of set screws 69 so that it can be adjusted to take up wear. If desired the two sets of rollers 63 and 64 may be provided with tightening or adjusting screws, not shown, to enable them to be so adjusted as to cause the transfer rollers 63 to properly mat together the opposite sides or edges of the paper while it is carried forward by the feed rollers 64 to the cutting mechanism 66 and 67 as above described.

In order to provide for operating the feed or tension rollers 64 and revolving cutter 67, the shaft 5 of the coating drums 6 and 12 may be provided with a bevel gear 70, Fig. 4, meshing with a bevel pinion 71 on one end of a line shaft 72 supported in suitable bearings 73 and extended longitudinally with the frame of the machine. The shaft 72 carries a bevel pinion 74, Fig. 2, that meshes with a bevel gear 75 on a transverse shaft 76 that is connected by bevel gearing, not shown, with the feed rollers 64, whereby said rollers are actuated. The transfer rollers 63 are actuated by frictional contact of the moving paper strip and, therefore, require no gears. One of the feed rollers 64 is geared through an intermediate gear 77 to a spur gear 78 on the lower end of a vertical shaft 79 to which the cutter head 68 is secured, thus providing for actuating the rotary cut off knife. If desired the shaft 79 may be provided with a crank-arm 80 for attachment of a lever 81, Fig. 2, through which any suitable counting or register and alarm mechanism, not shown, may be actuated for the purpose of indicating the amount of work accomplished by the machine.

It will be observed that as the two coating drums 6 and 12 are rigidly secured to the same shaft and thereby caused to rotate together the fields 8 and borders 15 will be so applied to the paper that when the paper strip is folded longitudinally, as described, there will be an accurate register of the said fields and borders and a mutual transfer of the same from one side of the paper to the other, so that both sides will be alike, each comprising a series of sticky fields surrounded by borders of somewhat greater adhesiveness and each inclosing, if desired, a cross or star shaped center piece 17 also of greater adhesiveness or consistency than the field. It may also be observed that by actuating the rollers 64 and rotary cut off knife 67 from the shaft 5 of the coating drums 6 and 12 the machine will be accurately timed so that the cutting of the sheets will be assured to occur in the uncoated spaces 11, Fig. 3, left by the gaps 9 or flat portions 10 of the coating drums. These features of the machine are of great importance in facilitating the rapid and economical manufacture of sticky fly paper from a single continuous strip of paper, thereby insuring more perfect work than can be accomplished by using two separately coated sheets or strips.

For the purpose of governing the thickness of the coating to be applied to the paper and to insure clean margins between the several sheets or prints we may employ a longitudinal scraper 82, Fig. 5 attached to arms 83 by means of set screws 84 and jam nuts 85 and arranged to extend the entire length of the coating drum 6 by which the fields 8 are applied to the paper strip. The points of the set screws 84 extend into annular grooves 86 that are formed in the drum 6 near its ends, and by properly manipulating these screws and nuts the scraper can be readily adjusted so as to scrape all surplus of coating material from the drum and thereby regulate the thickness of the coating to be applied to the paper. At the flattened sections 10 of the drum 6, Fig. 5, the grooves 86 are deepened so that the scraper 82 is allowed to drop at those points and take all the coating thus insuring clean margins between the prints or several sections of the coated paper strip. Any suitable springs 87 may be arranged to bear on the arms 83 in such a manner as to hold the set screws firmly in contact with the bottoms of the grooves 86 and thus cause the scraper to act properly and uniformly. The springs 87 and arms 83 may be attached to suitable supports by means of set screws 88 that can be adjusted to regulate the tension of said springs, as required.

The bearings of the roller 32 and perforating wheel 34 may be arranged in a vertically movable box or frame 89, Fig. 1 having a lever 90 attached thereto by which said roller and perforating wheel can be lifted away from the coating drum 6 whenever the operator sees that the paper strip is torn or mutilated or has holes therein through which the coating material on the drum would pass through onto the roller 32 and thence to the outside of the paper strip. By thus arranging the roller 32 so that it can be lifted away from the drum 6, when required, the outside of the paper strip can be kept clean and pro-

tected from the accidental application of coating material through any holes or imperfections that may exist in the paper.

In order to prepare the product of the machine for use as a device for catching and destroying flies and other insects it is only necessary to separate the opposite edges of the doubled sheet and, if smaller sheets are required, tear the same apart along the line of perforations 41, Fig. 3, when each half or section can be employed separately in the well known manner.

What we claim as our invention, is—

1. In a machine for making sticky fly paper, the combination of a tank divided into two compartments for containing adhesive material, a shaft journaled on the tank, a pair of drums both mounted on said shaft in line with each other and arranged, respectively, in the two compartments, one drum serving to apply the sticky field to the paper at one side of the median line thereof and the other drum having annular ribs 13 and transverse ribs 14 to apply an adhesive border to the paper at the opposite side of the median line thereof and across the width of the same, and a folding device for folding the paper longitudinally, substantially as described.

2. In a machine for making sticky fly paper, the combination with a tank divided into two compartments for containing adhesive material, of a pair of drums arranged respectively in the two compartments, one drum serving to apply the sticky field to the paper at one side of the median line thereof and the other drum having annular ribs 13 and transverse ribs 14 to apply an adhesive border to the paper at the opposite side of the median line thereof and across the width of the same, substantially as described.

3. In a machine for making sticky fly paper, the combination with a tank for the sticky coating material, and a rotary drum mounted in said tank and adapted to apply the sticky coating to a continuous strip of paper, of a supply tank, a pipe leading from the bottom portion of one tank to the bottom portion of the other tank and having one end constructed with a valve seat and extended upward within the supply tank, a lever having suspended from one end a valve adapted to the valve seat of said connecting pipe to control the flow of sticky material from the supply tank and a float suspended from its other end to operate in the material contained in said coating tank, and an adjustable weight attached to said lever to control the reciprocal movements of said float and valve according to the required depth of material in the coating tank, substantially as described.

4. In a machine for making sticky fly paper, the combination with a rotary drum for applying sticky coating material to a continuous strip of paper, a reel for supporting the roll of paper, and feed rollers located intermediate said reel and rotary drum, of vertically movable yokes in which one of the upper feed rollers is journaled, weighted levers to which the lower ends of said yokes are pivotally attached, levers pivoted to the frame of the machine below the weighted levers and connected therewith by intermediate links, and a vertically movable sag roller normally supported in the slack of the moving paper strip and adapted to drop on to said lower levers and thereby through the link connection actuate the weighted levers to raise the yokes and attached upper feed roller to stop the feed when too rapid, substantially as described.

5. In a machine for making sticky fly paper, the combination with a reel for supporting a roll of paper, a rotary drum for applying sticky coating material to a moving strip of paper, and feed and guide rollers located intermediate said wheel and rotary drum, of an automatically controlled feed and tension mechanism for governing the slack of the paper, substantially as described.

6. In a machine for making sticky fly paper, the combination with two rigidly connected rotary drums one of which is adapted to apply coating material to a continuous strip of paper in the form of a series of sticky fields on one side of the longitudinal median line of said paper and the other drum adapted to apply a more sticky coating material to the other side of said median line in the form of a series of borders to register with said fields, of a roller located above said drums in position to coact therewith in coating said paper strip, and a perforating wheel located above said roller in contact with the coated paper strip to provide the same with a series of perforations in its median line, substantially as described.

7. In a machine for making sticky fly paper, the combination with the coating mechanism, of a concaved cooling trough adapted to receive the coated strip of paper, said trough being gradually increased in depth and decreased in width from its receiving end to its exit end, substantially as described.

8. In a machine for making sticky fly paper, the combination with the coating mechanism, of a concaved cooling trough constructed with double walls to form a water jacket that is divided into two compartments by a longitudinal partition at its bottom, said trough being gradually increased in depth and decreased in width from its receiving end to its exit, substantially as described.

9. In a machine for making sticky fly paper, the combination with the coating mechanism, of a cooling trough constructed with double walls to form a water jacket and provided with an inlet at one end and an outlet at its other end, substantially as described.

10. In a machine for making sticky fly paper, the combination, with a cooling trough through which a continuous strip of coated and longitudinally perforated paper is passed from a coating and perforating mechanism, of

creasing plates to fold the said strip of paper longitudinally in the line of its said perforations, substantially as described.

11. In a machine for making sticky fly paper, the combination with a cooling trough that is gradually increased in depth and decreased in width from its receiving end to its exit end, said trough adapted to receive a continuous strip of coated and longitudinally perforated paper from a coating and perforating mechanism, of creasing plates that receive and fold the paper in its line of perforations as it leaves the exit end of said trough, and vertical transfer rollers between which the folded strip of paper is passed to mat the opposite sides together and effect a mutual transfer of their respective coatings of sticky material, substantially as described.

12. In a machine for making sticky fly paper, the combination with the transfer rollers, of a pair of feed rollers adapted to receive the folded strip of paper from said transfer rollers and provided with enlarged ends to grasp said paper along its uncoated margins, stationary plates or cutters between which the folded strip of coated paper is passed from said feed rollers, and a rotary cut off knife to sever said folded strip into proper lengths, substantially as described.

13. In a machine for making sticky fly paper, the combination with two rotary drums rigidly connected and adapted to rotate together for the purpose of applying sticky coating material to a continuous strip of paper on opposite sides of the median line thereof, so that when said paper is folded longitudinally the coatings applied by the respective drums will register with each other, of a folding mechanism, a feeding and cutting mechanism comprising two vertical rollers and a rotary cutter, and gearing for actuating said feeding and cutting mechanism from the rotary coating drums, whereby the continuous paper strip is severed into suitable lengths through the uncoated spaces or intervals between the coated surfaces, substantially as described.

14. In a machine for making sticky fly paper, the combination with a rotary coating drum having annular grooves at or near its ends and provided at intervals with flattened or reduced portions corresponding with the uncoated separating margins to be left on the coated paper strip between the several prints or sheets, said grooves being deepened at said flattened or reduced portions of the drum, of a scraper extended lengthwise of said drum, arms to which said scraper is attached by means of set screws that are adjustably engaged in the grooves of the drum whereby the scraper is adapted to control the thickness of the coating material on the drum, and springs bearing on said arms to hold the scraper in operative position, substantially as described.

15. In a machine for making sticky fly paper, the combination with a coating drum and a roller and perforating wheel arranged above said drum, of a vertically movable box or frame in which said roller and perforating wheel are supported and a lever attached to said box or frame for lifting the roller and perforating wheel away from the coating drum, substantially as described.

In testimony whereof we have hereunto set our hands and affixed our seals in presence of two subscribing witnesses.

JAY HUNGERFORD SMITH. [L. S.]
MARK DEAN KNOWLTON. [L. S.]

Witnesses:
HORACE MCGUIRE,
HIRAM R. WOOD.