

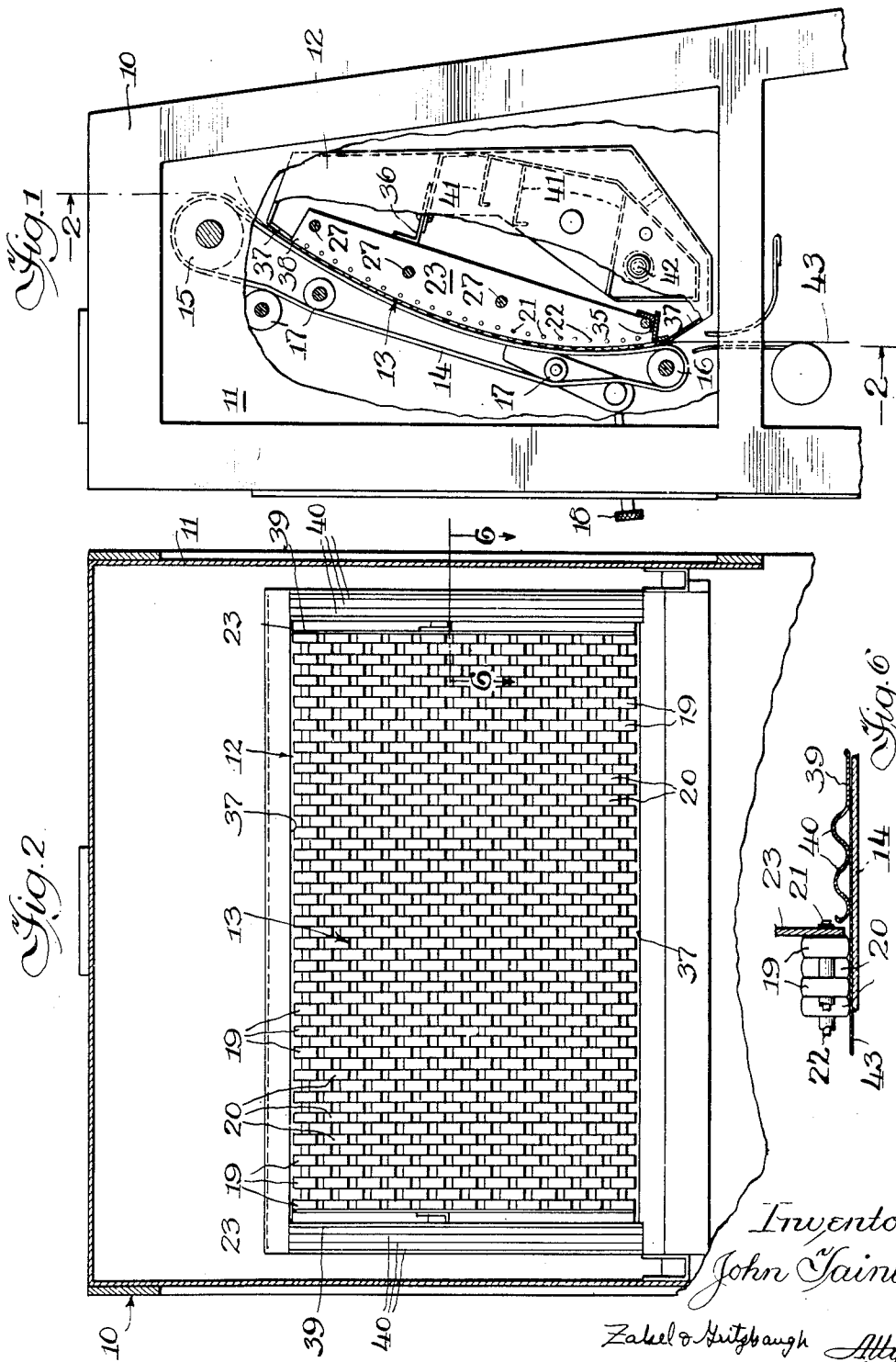
Jan. 20, 1953

J. TAINI
PRINT DEVELOPER

2,625,865

Filed Aug. 5, 1949

2 SHEETS—SHEET 1



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2 SHEETS—SHEET 2

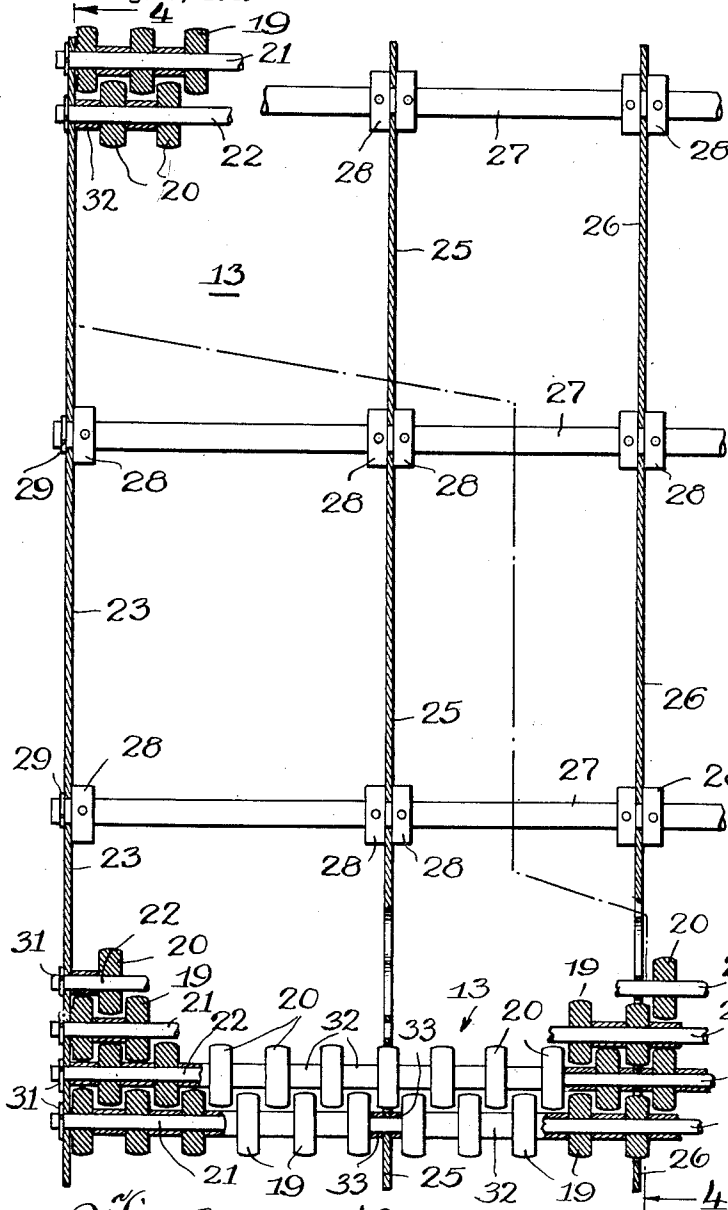


Fig. 3

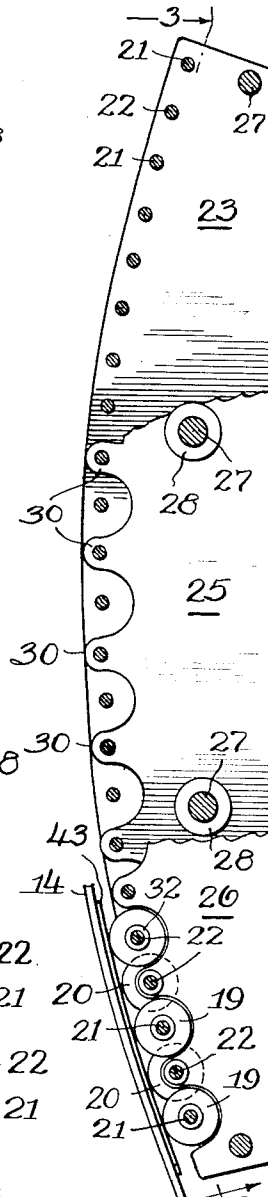


Fig. 4

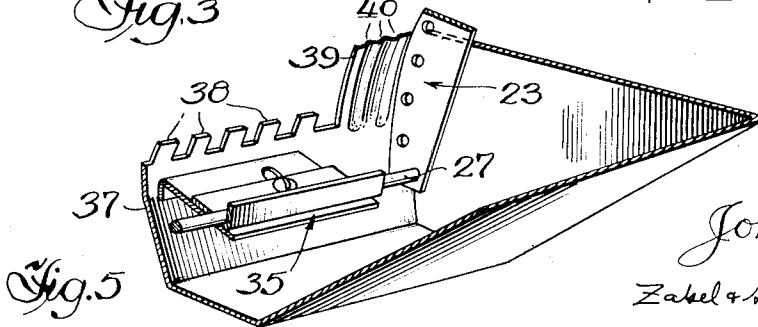


Fig. 5

Inventor,
John Taini,

Zabel & Britzbaugh

Attys.

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2,625,865

PRINT DEVELOPER

John Taini, Chicago, Ill., assignor to The C. F. Pease Company, Chicago, Ill., a corporation of Delaware

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2 Claims. (Cl. 95—89)

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This invention relates to improvements in gas print developers; that is, an apparatus for developing light sensitive prints by gas such as ammonia.

A device of this type is shown in Patent No. 2,384,155 granted September 4, 1945. In such a device a sensitized and exposed print, a diazo-type print for example, is caused to pass over and across one wall of a chamber in which ammonia or other gas is being generated. The wall, hereinafter referred to as a guide wall, is constructed so as to permit the gas to pass through the wall and into contact with the print, the sensitized surface of which faces the guide wall. Heretofore, the guide wall has comprised a sheet of corrosion resistant metal, such as stainless steel, which was provided with perforations. An endless belt passes over the perforated plate and causes the print to be advanced.

This perforated plate of the prior art has certain objectionable features. For instance, the interior of the chamber is heated to release the ammonia gas from ammonia water with the result that the perforated plate becomes heated. When prints made of cellophane foil or of tracing cloth are passed through the machine, the heated plate causes the print to become tacky with the result that it adheres to the plate instead of sliding smoothly over it. Furthermore, the edges of the perforations cause excessive belt wear, especially along the edges of the belt which are in direct contact with the plate when narrow prints are being run through the developer.

It is an object of my invention to provide a developer having an improved guide wall which eliminates the sticking of prints and which materially reduces belt wear, and eliminates any sliding contact with the print.

I have found that sticking may be avoided by providing a guide wall which has a lesser area of contact with the print than that area provided by a perforated plate. Furthermore, a reduction in contact area permits faster operation of the developer since a greater proportion of the sensitized surface of the print is being exposed to the action of the gas at any one instant.

A further object of my invention is to provide an improved guide wall which makes a rolling contact with the prints and which is constructed in such a manner that the prints cannot be inadvertently fed into the interior of the gas generating chamber.

A still further object is to provide an improved guide wall of comparatively simple and inexpensive construction.

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With reference now to the drawings in which like reference numerals designate like parts:

Fig. 1 is a side elevation of a preferred embodiment of my invention, a portion of the casing being broken away;

Fig. 2 is a view taken generally along line 2—2 of Fig. 1 and showing the guide wall in front elevation;

Fig. 3 is an enlarged view of a portion of the guide wall, some of the rollers being eliminated for purposes of clarity;

Fig. 4 is a section taken along line 4—4 of Fig. 3;

Fig. 5 is a detailed perspective view showing the means for mounting the guide wall; and

Fig. 6 is a detailed section showing the seal provided for the side edges of the belt.

Referring now to Figs. 1 and 2, the reference numeral 10 designates generally the frame of the developer, and the reference number 11, a housing which is partially broken away in Fig. 1. Within the housing is disposed a gas generating chamber 12 having a guide wall 13. An endless belt 14 passes between rollers 15 and 16 and over the guide wall 13. Suitable belt tensioning rollers 17 are provided, one side of which may be adjusted by suitable means which includes a knob 18.

A guide wall 13 comprises a number of rollers 19 and 20 which are mounted on two series of rods 21 and 22 respectively. The rods are supported at their ends by means of end plates 23 and at intermediate portions by means of bridge plates 25 and 26. As shown in Figs. 3 and 4 the end plates and bridge plates are disposed in a plane which is generally perpendicular to the print path which is provided by the rollers 19 and 20. The plates are maintained in spaced relationship by tie rods 27 which are secured to the end plates 23 by means of collars 28 and split washers 29. The ends of the tie rods may be suitably grooved for cooperation with the split washers and the collars are held in place by the usual set screws. The bridge plates are also maintained in spaced relationship by collars 28 disposed on the tie rods.

The rods of the first and second series 21 and 22, respectively, are supported at their ends by the end plates 23. Split washers 31 maintain the axial positions of the rods. The bridge plates 25 and 26 are each provided with projecting lugs 30 which are apertured to receive the rods 20 or 21 whereby the rods may be supported at points intermediate the end plates. The spacing between adjoining lugs 30 on each bridge plate is equal to the spacing between alternate rods, and the

lugs of one plate are staggered with respect to the lugs of the other plate. Thus, the rods 21 are supported by bridge plates 25, and rods 22 are supported by bridge plates 26.

The rollers 19 and 20, respectively, are axially spaced from each other by means of spacer 32, and at the point where the bridge plates intersect the space between adjacent rollers, half spacers 33 are employed to maintain uniform spacing of all the rollers on each rod. The spacers maintain the rollers 19 in a position opposite the space between rollers 20 and vice-versa. The spacing between adjacent rods 21 and 22 is such that the rollers 19 and 20 overlap each other. Thus, there is no danger that a print which is being fed over the surface defined by the rollers 19 and 20 can pass through the guide wall and into the interior of the chamber 12.

The rollers are preferably crowned so as to reduce the area of contact between the print and the guide wall. Thus, a much greater proportion of the area of the print is disposed to the action of the gas than is the case when a perforated plate is used. Furthermore, since there is less area of contact, less heat will be transferred to the paper with the result that cellophane foil prints and tracing cloth prints will not soften up and stick.

The rods 21 and 22 are preferably aligned in such a manner that the surface defined by the rollers is a convex surface; thus a uniform belt pressure can be maintained. The rods 21 and 22 will not flex even under comparatively heavy belt pressures, due to the fact that they will be supported at intermediate points by bridge plates. The guide wall constitutes a structurally independent unit which may be removed for repair or replacement. The rollers 19 and 20 are preferably screw machine products and can be made from any suitable metal which is resistant to the action of the particular gas which is employed. It has been found that the cost of a guide plate made in accordance with this invention compares favorably with the cost of a perforated plate made of heavy gauge stainless steel, which due to its thickness is very difficult to perforate.

As shown in Figs. 1 and 5 the guide wall 13 is removably mounted in the chamber 12 by means of an adjustable lower bracket 35 and an adjustable upper bracket 36. The lower bracket is engaged by the lowermost tie rod 27, whereas the upper bracket engages the rear edges of one or more of the plates 23, 25 and 26.

The belt rollers 16 and 17 may be mounted to swing upwardly about the center of roller 15 to permit access to and removal of the guide wall 13.

Chamber 12 includes upper and lower marginal portions 37 which are provided with tongues 33 which project into the spaces between the first and last row of rollers 19 as shown in Fig. 2. The chamber also includes side marginal portions 39 which are provided with corrugations 40 over which corrugations the edges of belt 14 slide. The corrugations provide a low friction seal between the belt and the chamber which reduces the loss of gas. As shown in Fig. 1, the chamber is provided with one or more trays 41 to which ammonia water is supplied, and a heater element 42 positioned between the lowermost tray which serves to release the ammonia gas, as described in the aforementioned Patent No. 2,384,155.

Suitable means, not shown, may be provided to exhaust whatever ammonia gas escapes from the chamber 12 into the housing 11.

In operation, the roller 15 is driven by suitable

means which causes the inner span of the belt to move upwardly across the guide wall 13. An exposed print 43 is fed between the belt 14 and the lower marginal portion 37 and is caused to advance across the guide wall where it is subjected to the developing action of ammonia or other gas. The print is delivered at the top of the machine and a suitable delivery tray may be provided.

Due to the provision of rollers 19 and 20, the print will slide smoothly and without sticking, due to the fact that a rolling contact is provided and due also to the fact that the actual area of contact between the print and rollers is comparatively small. Hence, less heat will be transmitted to the surface of the print. Furthermore, the small amount of contact area exposes a greater proportion of the surface of the print to the developing action of the gas and permits faster operation.

The developer may be sold as an independent unit, or it may form a part of a combined printing and developing machine, in which case the exposed prints may be fed continuously and automatically upward into the developer.

I claim:

1. A print developer comprising means providing a chamber, one wall of which is provided with oppositely spaced side marginal portions defining an opening therebetween, a structurally independent guide wall disposed within said opening, a belt cooperating with said guide wall and said side marginal portions, means for driving said belt over the path provided by said guide wall, each of said side marginal portions being provided with a plurality of belt contacting portions, at least one of which is in the form of a corrugation extending in the direction of belt movement, said belt being wider than said guide wall and engaging the belt contacting portions of each of said side marginal portions to provide a seal for preventing the escape of gas from said chamber, means for releasing a gas within said chamber for developing a print which is advanced across said guide wall by said belt, said guide wall comprising a pair of end plates, means including a tie rod for maintaining said end plates in spaced parallel relationship to provide a structurally independent unit, a first series of rods supported at their ends by said end plates, a plurality of substantially identical separate rollers coaxially mounted on each of said rods for independent rotation with respect to each other, means for axially spacing said rollers from each other, a second series of rods supported at their ends by said end plates and alternating with the rods of said first series, a plurality of substantially identical separate rollers coaxially mounted on each of the rods of said second series for independent rotation with respect to each other, and means for axially spacing said rollers from each other so that they are staggered with respect to the rollers disposed on the rods of said first series, the spacing between adjacent rods being such that said rollers are interleaved with each other to prevent a print from passing between the rollers on adjacent rods, and said rods being aligned in side by side relationship so that the rollers carried thereby define a convexly curved surface for cooperation with said belt, said rollers being crowned so as to reduce the area of contact between the print and the guide wall, and a bracket mounted on said chamber providing means and engaging said tie rod for removably

supporting said structurally independent guide wall in position in said opening.

2. A print developer comprising means providing a chamber, one wall of which is provided with oppositely spaced side marginal portions defining an opening therebetween, a guide wall disposed within said opening, a belt cooperating with said guide wall and said side marginal portions, means for driving said belt over the path provided by said guide wall, each of said side marginal portions being provided with a plurality of belt contacting portions, at least one of which is in the form of a corrugation extending in the direction of belt movement, said belt being wider than said guide wall and engaging the belt contacting portions of each of said side marginal portions to provide a seal for preventing the escape of gas from said chamber, and means for releasing a gas within said chamber for developing a print which is advanced across said guide wall by said belt, said guide wall comprising a pair of end plates and two intermediately disposed bridge plates, means for maintaining said plates in spaced parallel relationship, a first series of rods supported at their ends by said end plates, one of said bridge plates having projecting lugs for supporting the rods of said first series at an intermediate point, a plurality of substantially identical separate crowned rollers mounted on each of said rods for independent rotation with respect to each other, means for axially spacing said rollers from each other, a second series of rods supported

at their ends by said end plates and alternating with the rods of said first series, the other one of said bridge plates having projecting lugs for supporting the rods of said second series at an intermediate point, a plurality of substantially identical separate crowned rollers mounted on each of said second series for independent rotation with respect to each other, and means for axially spacing said rollers from each other so that they are staggered with respect to the rollers disposed on the rods of said first series, the spacing between adjacent rods being such that said rollers thereon interleave with each other, and said rods being so aligned in side by side relationship that the rollers carried thereby define a convexly curved surface for cooperation with said belt.

JOHN TAINI.

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