

Sept. 12, 1950

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2,522,115

PRINT DEVELOPING MACHINE AND APRON THEREFOR

Filed Jan. 2, 1948

FIG-1

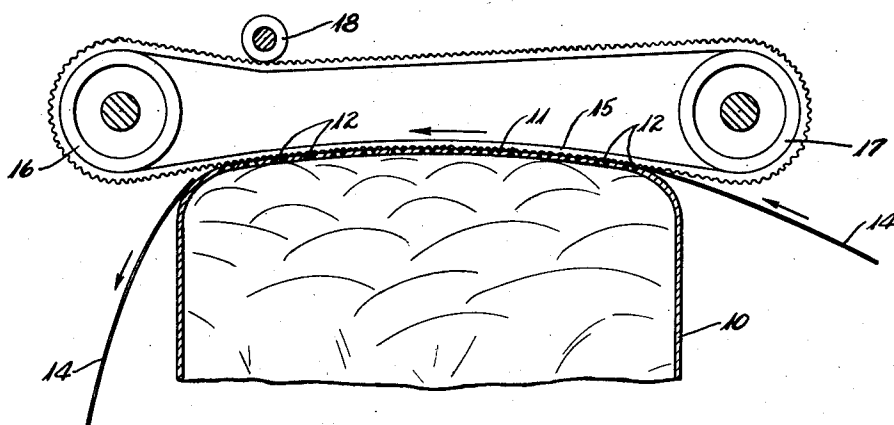
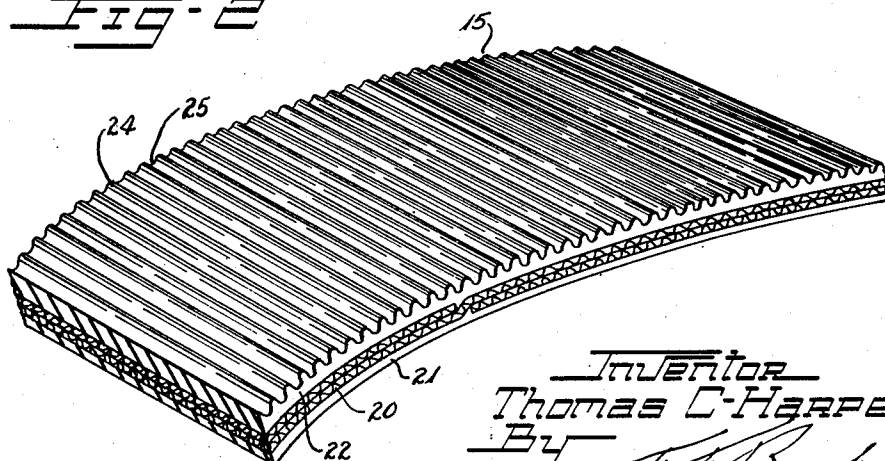


FIG-2



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UNITED STATES PATENT OFFICE

2,522,115

PRINT DEVELOPING MACHINE AND
APRON THEREFOR

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Application January 2, 1948, Serial No. 294

8 Claims. (Cl. 95—89)

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This invention relates to the dry development of photographic prints and is especially useful in the dry development of prints by ammonia or other gases.

In the development of photographic prints of drawings, ammonia fumes are generated within a container having a perforate top, and the prints are progressively passed over the container by an endless apron. Heretofore difficulties have been experienced in that such aprons as have been employed have become smooth and glazed in use and have interfered with proper feeding of the prints. Furthermore, such aprons at times have not permitted good circulation of the fumes about the print, resulting in reduction of speed of the machine, while, at the same time fumes have been permitted to escape undesirably into the surrounding atmosphere.

It is an object of the present invention to overcome the foregoing and other difficulties.

Other objects of the invention are to provide good gripping of the prints for positive feeding, to provide for minimizing the escape of the fumes especially in the direction of apron travel, to provide a straight-running flexible apron, and further to provide high flexibility of the apron.

These and other objects will appear from the following description and the accompanying drawings.

Of the drawings,

Fig. 1 is a cross sectional view of a print-developing machine showing the fuming container, the apron, and the supporting rollers therefor, other parts being broken away.

Fig. 2 is a perspective view of a portion of the apron.

Referring to the drawings, the numeral 10 designates a closed container defining a fume chamber and having a convexly curved upper wall 11 having perforations 12 at regular intervals thereover for emitting fumes. Ammonia water is heated within the container to provide ammonia gas therein. The prints, such as 14, are gripped and fed across the convex perforate face of the container 10 progressively by an apron 15 trained about guiding and driving rollers 16, 17 with the lower reach of the apron opposed to the convex surface of the container, tension being applied to the apron by a tension guide roller 18.

The apron 15 is formed of a stretch-resisting body 20 of rubberized fabric having a protective back layer 21 of rubber or other rubber-like material and a face layer 22 also of similar rubber-like material vulcanized to each other.

To provide positive feed of the prints and at

the same time to permit good circulation of fumes through and about the prints while confining the fumes from undesirable escape in the direction of apron travel, the face layer 22 is formed of alternate, laterally extending ribs 24 and grooves 25, the laterally extending ribs being rounded to seal off the fumes under light tensioning of the apron along parallel lines extending perpendicular to the direction of travel of the apron. As the apron is wider than its reach in contact with the container, this construction substantially seals in the fumes permitting escape only at the sides of the apron where the fumes may be readily carried away by exhaust fans, such slight escape being beneficial in permitting flow of fumes laterally of the print along the grooves.

The line contact of the ribs permits free circulation of fumes over substantially the entire back surface of the prints, thereby permitting development from both sides of the paper.

The lateral grooves also provide a highly flexible low surface tension apron in which the print contacting surface is substantially free from tension due to the rib and groove construction thereof and is therefore relatively free from cracking and abrasion due to tension. The rounded ribs make line contact across the print providing a good grip upon the paper of the prints while at the same time sealing off the fumes.

Variations may be made without departing from the scope of the invention as it is defined by the following claims.

I claim:

1. In apparatus for the dry development of photographic prints, the combination of a fume chamber having a print-contacting surface, and an apron movable over said surface in contact with a print thereon, said apron comprising a body of flexible material having a print-contacting face of resilient rubber-like material with a succession of fume-conducting grooves in said face disposed cross-wise of said face and perforated surface for circulation of fumes reaching said grooves from the perforations of said surface, said face of the apron having print-contacting and chamber-contacting portions between and coextensive with said grooves cross-wise of the apron to restrict travel of fumes longitudinally of the apron and frictionally engage a print for advancing it over said surface.

2. In apparatus for the dry development of photographic prints, the combination of a fume chamber having a perforated print-contacting surface, and a flexible apron movable along said surface with a face of the apron toward said sur-

face, said face comprising a series of grooves disposed cross-wise of the apron and, alternating with said grooves, a series of ribs of resilient rubber-like material coextensive with said grooves cross-wise of the apron and presenting longitudinally spaced-apart surfaces engageable with a print at spaced-apart positions along the same for advancing the print along said surface and for restricting flow of the fumes in the longitudinal direction of the apron.

3. In apparatus for the dry development of photographic prints, the combination of a fume chamber having a perforated print-contacting surface, and an apron movable along said surface with a face of the apron toward said surface, said apron comprising a body of flexible material having a print-contacting face of resilient rubber-like material with a succession of fume-conducting grooves in its print-contacting face disposed cross-wise of said face coextensively with the width of the perforated area of said surface for circulation of fumes reaching said grooves from said perforated surface, said face of said apron having cross-wise ribs alternating with said grooves and presenting relatively narrow portions of said resilient material for contacting a print at spaced-apart positions along the same to advance the print over said surface.

4. In apparatus for the dry development of photographic prints, the combination of a fume chamber having a convex perforated surface for contacting the face of a print, and an apron of greater width than the perforated area of said surface and having a reach movable along said convex surface for advancing a print along said surface between said apron and said surface, said apron comprising an endless body of resilient rubber-like material having a print-contacting face of said rubber-like material with a succession of fume-conducting grooves in said face disposed cross-wise of said face and said perforated area for circulation of fumes reaching said grooves from said perforated surface, said face of the apron having print-contacting and chamber-contacting portions between and coextensive with said grooves cross-wise of the apron to resist travel of fumes longitudinally of the apron and frictionally engage a print for advancing it over said convex surface.

5. A print-developing apron for advancing a print along the perforated surface of a fume chamber, said apron comprising a flexible body for advancing along said surface with a face of the body toward said surface, said face comprising a series of grooves disposed cross-wise of the apron and, in alternation therewith, a series of print-contacting portions of flexible material spaced-apart longitudinally of the apron to engage a print frictionally at spaced-apart positions along the same for advancing it along said surface.

6. A print-developing apron for advancing a print along the perforated surface of a fume

chamber, said apron comprising a flexible body for advancing along said surface with a face of the body toward said surface, said face comprising a series of fume-conducting grooves disposed cross-wise of the apron for circulation of fumes reaching said grooves from said perforated surface, and said face of the apron having print-contacting and chamber-contacting ribs of resilient rubber-like material between and coextensive with said grooves cross-wise of the apron to resist travel of the fumes longitudinally of the apron and frictionally engage a print at spaced-apart positions along the same for advancing it along said surface.

7. A print-developing apron for advancing a print along the perforated surface of a fume chamber, said apron comprising a flexible body for advancing along said surface with a face of the body toward said surface, said face comprising a series of alternating grooves and ribs disposed cross-wise of the apron, said ribs having longitudinally spaced-apart relatively narrow face portions of resilient rubber-like material engageable with a print on said surface at spaced-apart positions along the print to advance it frictionally along the surface.

8. A print-developing apron for advancing a print along the perforated surface of a fume chamber, said apron comprising a flexible endless body of resilient rubber-like material including a flexible reinforcing material therein for advancing along said surface with a face of the said rubber-like material toward said surface, said face comprising a series of fume-conducting grooves disposed cross-wise of the apron for circulation of fumes reaching said grooves from said perforated surface, and said face of the apron having print-contacting and chamber-contacting portions of said rubber-like material between and coextensive with said grooves cross-wise of the apron to resist travel of the fumes longitudinally of the apron and frictionally engage a print at spaced-apart positions along the same for advancing it over said surface.

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REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
854,026	Brownell	May 21, 1907
1,948,332	Carter	Feb. 20, 1934
2,194,833	Nassimbene	Mar. 26, 1940
2,219,584	Meister et al.	Oct. 29, 1940
2,350,257	Steglich	May 30, 1944
2,436,761	Ross et al.	Feb. 24, 1948

FOREIGN PATENTS

Number	Country	Date
729.107	France	Apr. 19, 1932