

Aug. 8, 1944.

E. P. RIDDICK

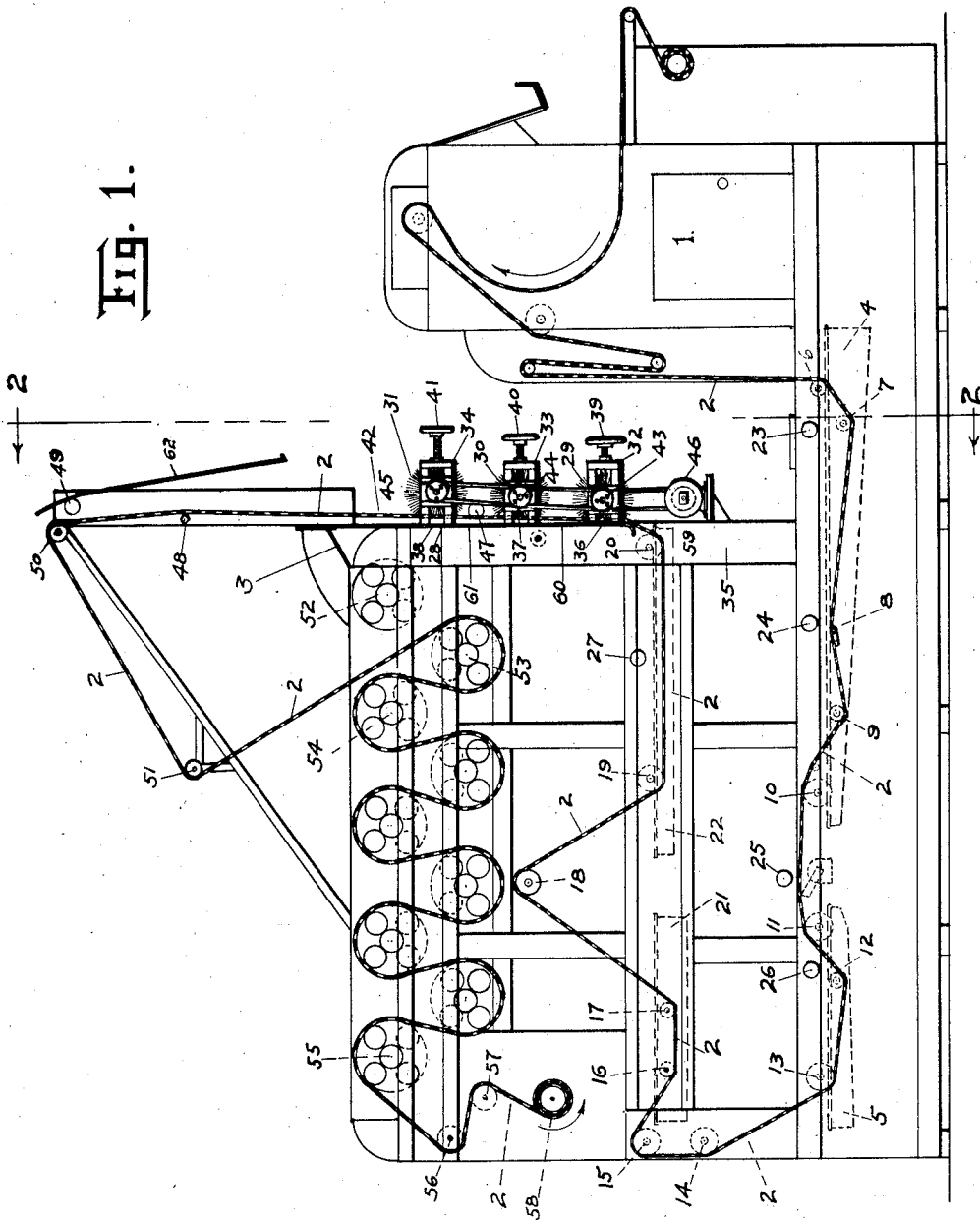
2,355,109

REPRODUCING MACHINE

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2 Sheets-Sheet 1

FIG. 1.



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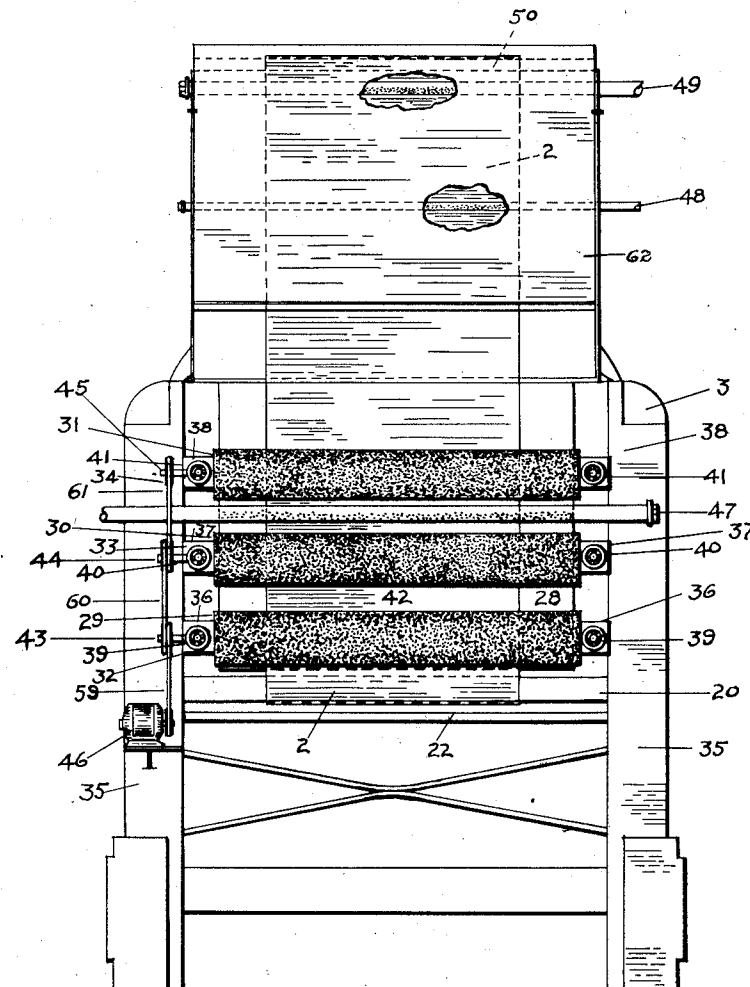
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2 Sheets-Sheet 2

Fig. 2.



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REPRODUCING MACHINE

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7 Claims. (Cl. 95—94)

(Granted under the act of March 3, 1883, as amended April 30, 1928; 370 O. G. 757)

The present invention relates to improvements in machines commonly used for continuous blue-printing, and manufacture of Van Dyke, and other prints in which, by the addition of the new parts and devices to the original older type of machines, much time is saved in the production of "See-Bees," and a great saving in cost of same accomplished by the use of the improved machines. The trade name See-Bee is a reproduction of a tracing made on a sensitized water-proof tracing cloth, and the finished article has the general appearance of an inked tracing.

By the use of the commonly used "See-Bee" reproducing machines (vacuum frame), prints about seventeen feet long are about the largest size that can be produced, and considerable manual labor is required to produce these prints. The present invention is an improvement in commonly used type of blue print, and Van Dyke machines. With the usual type of machines used for the purpose in hand, there is normally a "printing unit," and a "washing, developing and drying unit" which cooperate to produce the finished prints.

The device in hand more particularly relates to the "washing, developing and drying unit" of the reproducing machine. The present continuous reproducing process substitutes for a fixed, non-continuous static vacuum frame, arc lamp method heretofore use, a machine with an added means whereby continuous reproduced prints, such as "See-Bees," are made at the rate of about seven feet per minute, said prints emerging from the machine fully developed, cleaned, dried and ready for use. Moreover, this machine produces finished See-Bees or other prints about 12 to 15 times faster than the rate by the above described static method, and electric current, water, "chemical developer," and labor costs are also cut materially by the present invention.

The cost of the cloth used for printing remains about the same in both the old and improved types of machines. As a result of the above advantages of the present invention, large savings have been demonstrated to be obtainable by its use and See-Bees produced at the rate of seven feet per minute. Both time and money are saved by the use of the present machine. Other advantages will be described as the description proceeds herein.

In the accompanying drawings forming part of the present specification:

Fig. 1 is a vertical elevation of a reproducing machine taken from the left of Fig. 2 with the improved apparatus of the present invention

mounted on the forward end of the "washing, developing and drying unit" of the printing machine.

Fig. 2 is an elevation of the washing, developing and drying unit above mentioned taken on line 2—2 of Fig. 1.

The device normally used for producing See-Bees involves a static vacuum frame and arc lamps. This portion of the method of producing See-Bees is usually performed in what has been called the "printing unit" of the device as shown in Fig. 1, and indicated by the numeral 1. Via the old method a Van Dyke is placed on a glass held within the frame of a printing unit, chemically treated cloth is placed on top of this, and then a rubber covering blanket piped to a vacuum pump securely holds the Van Dyke and See-Bee cloth on the glass which is then exposed to arc lamps three or four feet away for a period of about ten minutes. This portion of the new method for reproducing See-Bees will not be described in detail as the same is comparatively old in the art and is merely the first part in the operation of the improved present machine. The printing unit 1 is similar to all modern machines.

The continuous cloth to be printed 2 leaves the printing unit 1 and enters the water bath and water spray system shown in the lower portion of the washing, developing and drying unit 3. The numeral 4 indicates a tray and 5 also indicates a tray both of which contain water. The cloth 2 is directed along through the said trays 4 and 5 by means of the usual rollers 6 to 13 inclusive, operated by means not shown on the drawings. The cloth 2 then passes over the rollers 14 and 20 inclusive. Numerals 21 and 22 are trays similar to 4 and 5. The tray 21 is a "developing bath" tray in which "chemical developer" or Van Dyke "intensifier" can be used. The cloth 2 proceeds over the roller 18, vertically adjustable in suitable guides not shown which is an idler roller used to lengthen the developing time for the cloth in the tray 21. It will be noted that roller 18 is part of the improvement covered in this invention. The cloth 2 then travels into the tray 22 as shown where it is again washed in water.

Attention is called to the water-spraying pipes 23 to 27 inclusive which are commonly used in connection with the trays 4, 5, 21 and 22 and same are common practice in the art as is at once understood. The cloth 2 proceeds from the roller 20 up the face of the wash plate 28 and comes in contact with the adjustable scrubbing brushes 29, 30, and 31 mounted in the supporting frames 32, 33, and 34, which, in turn, are mounted on the for-

ward end of the frame 35, as clearly shown in Figs. 1 and 2 of the drawings, at points 36, 37 and 38.

The screws 39, 40 and 41 are used to adjust the pressure of the brushes 29, 30, 31 respectively, against the ascending portion 42 of the printing cloth 2 as indicated in Figs. 1 and 2. The brushes 29, 30 and 31 are revolvably mounted on bearings at centers 43, 44 and 45 respectively. It will be noted that these brushes which are described are part of the "improvements" covered by the present invention. The three brushes 29, 30 and 31 are preferably belt or chain-driven from the electric motor 46 mounted on the front of the framework 35 as shown. After the ascending portion 42 of the cloth 2 has been scrubbed by the two lower revolvable brushes 29 and 30, chemical "reducer" is applied through pipe 47 and the cloth is again scrubbed by the third revolvable brush 31. Again it is to be noted that reducer pipe 47 is an improvement covered in this invention.

As the cloth 2 travels vertically upward, a small water-spray pipe 48 prevents the ascending portion 42 of the cloth 2 from adhering to the wash plate 28 and a larger spray pipe 49 washes the remaining chemical and any residue from the cloth 2. A splash plate 62 is mounted on a portion of the front frame 35 of the printing machine unit 3 for the purpose of covering any outward flying spray of water which is delivered from the large spray pipe 49 as is at once understood. Parts 28, 49 and 62 are all improvements covered in this invention.

The sensitized cloth or paper now having been printed, developed and washed, passes over the rollers 50 and 51 mounted on the frame of the printing machine unit 3, on to the series of drying rollers 52, 54, 55, etc., and the idler rollers 56, and 57, and thence on to final winding roller 58, in a manner similar to the path taken in making blueprints or Van Dykes with the exception that the first drying roller 52 is not used when printing See-Bees. Parts 50 and 51 and in part the complete frame above unit 3 is an improvement covered in this invention.

The above described operation produces completely finished cloth prints usually called "See-Bee prints" at the rate of about seven feet per minute. The present manufacture of prints by the above modified reproducing machine has been in use continuously since its adoption and prints have been produced at the rate of about 1500 per month during which period great appreciable savings in labor, and in time have been realized.

From the above description of the device in hand, it is seen that I have made improvements to the customary reproducing machines which comprises primarily the parts such as, the brushes 29, 30, 31 and their appurtenant parts, the chemical and water operating elements 47, 48, 49 and the roller 18, and the motor 46 with its accompanying belts or drive chains 59, 60 and 61.

The improvements, as is readily seen, are very readily added to existing machines and therefore they are inexpensive to apply and use for the purpose intended by the present invention. The speed of manufacture of reproduction of See-Bees is a very important matter in connection with the present invention since it is quite evident that the production of said See-Bees at the rate of seven feet per minute in their completely developed, washed, and dried form is an exceedingly high rate of production when considered with the present rates of production from the static vacuum non-continuous method.

From the above description it is seen I have devised a very useful and novel means of improvement to the present machines to adapt them for the production of continuous See-Bees which to my knowledge has never been done previously.

The invention described herein may be manufactured and used by and for the Government of the United States of America for governmental purposes without the payment to me of any royalties thereon or therefor.

I claim:

1. In a machine for producing continuous printed and developed sensitized tracing cloth a washing, developing, and drying unit having a frame and preliminary washing developing and subsequent washing means, a vertically disposed wash plate on the front of the unit frame, a plurality of lower adjustable horizontally mounted revolvable scrubbing brushes mounted on the front of the unit frame for scrubbing the cloth subsequent to the action of the last-mentioned washing means, a transversely positioned pipe mounted on the unit frame, adapted to spray chemical reducer fluid on the ascending portion of the cloth being treated, an upper adjustable horizontally mounted revolvable scrubbing brush mounted on the front of the unit frame, for scrubbing the chemical from the cloth subsequently to the action of the chemical carrying pipe, means for revolving all the scrubbing brushes, a water spray pipe near the top of the wash plate, for finally washing all the chemical and residue from the cloth, means for finally drying the latter and winding the same in continuous form on a final winding roller, and means for advancing the cloth through the washing, developing and drying unit.

2. In a machine for producing continuous printed and developed sensitized tracing cloth a washing, developing and drying unit having a frame, a plurality of preliminary washing pans, a chemical reducer pan and a subsequently operated washing pan, an idler roller located between the chemical reducer pan and the last-named washing pan, for lengthening the time of the chemical action on the cloth, a vertically disposed wash plate on the front of the unit frame, a plurality of lower horizontally mounted scrubbing brushes on the front of the unit frame for scrubbing the cloth subsequent to its passage through the last-mentioned washing pan, a transversely positioned pipe mounted on the unit frame and adapted to spray chemical reducer fluid on the ascending portion of the cloth being treated, an upper horizontally mounted scrubbing brush carried on the front of the unit frame for scrubbing chemical from the cloth, after the action of the chemical spraying pipe, means for revolving all the scrubbing brushes, a water spray pipe located between the wash plate and the rear surface of the cloth to prevent adherence of the cloth to the wash plate, and a large water spray pipe near the top of the wash plate for finally washing all the chemical and residue from the cloth, means for finally drying the cloth, and winding same in a continuous form on a final winding roller, and means for advancing the cloth through the washing, developing and drying unit.

3. In a machine for producing continuous printed and developed sensitized tracing cloth a washing, developing and drying unit having a frame and means for advancing a continuous strip of sensitized tracing cloth through said unit, a vertical wash plate mounted on the front of the unit frame, a plurality of lower adjustable

horizontally mounted revolvable scrubbing brushes mounted on the unit frame in proximate relation with the ascending portion of the cloth being treated and the wash plate of the unit, a transversely positioned pipe on the unit adapted to spray chemical reducer fluid on the said ascending portion of the cloth, an upper adjustable horizontally mounted revolvable scrubbing brush mounted on the front of the unit frame for scrubbing chemical from the cloth, means for revolving all the scrubbing brushes, a water spray pipe located between the wash plate and the ascending portion of the cloth, a second water spray pipe near the top of the wash plate for finally washing all the chemical and residue from the cloth, and means for finally drying and winding the cloth in a continuous form on a winding roller.

4. In a washing, developing and drying unit having a frame, for a continuous reproducing machine for printing and developing sensitized tracing cloth, a plurality of lower scrubbing brushes mounted adjacent to the front of the unit frame, a bearing for each of said brushes and adjustable means for operating the bearings of the brushes, a transverse spray pipe on the front of the frame unit adapted to spray chemical upon the cloth subsequent to the action of the lower scrubbing brushes, an upper revolvable scrubbing brush mounted on the front of the unit frame, an adjustable means for operating said brush against the face of the ascending portion of the cloth, a transverse water spray pipe between the wash plate and the back of the cloth, and a larger water spray pipe near the top of the water plate for finally washing the chemical and residue from the face of the cloth, means for advancing the cloth continuously through the unit and means for finally drying and winding the cloth in a continuous roll within the washing, developing and drying unit.

5. A scrubbing brush for a washing, developing and drying unit of a reproducing machine comprising a transverse revolvable cylindrical brush, a pair of opposed slotted supporting frames mounted on the end of the unit frame, a bearing for each end of the revolvable brush, each slidably mounted in the slots of one of the supporting frames, and an adjusting screw connected with a bearing mounted in the end of each supporting frame for regulating the pressure exerted by the scrubbing brush against the cloth of the reproducing machine.

6. In a reproducing machine, a primary unit for exposing a continuous sensitized cloth to a source of light, a secondary unit having a frame and means for applying a preliminary washing, developing and subsequent washing to said exposed cloth, a vertically disposed wash plate on

the front of the unit frame, a plurality of lower horizontally mounted revolvable scrubbing brushes mounted on the front of the unit frame for scrubbing the cloth subsequent to the action of the last-mentioned washing means, a transversely positioned pipe mounted on the unit frame, adapted to spray chemical reducer fluid on the ascending portion of the cloth being treated, an upper horizontally mounted revolvable scrubbing brush mounted on the front of the unit frame, for scrubbing the chemical from the cloth subsequently to the action of the chemical carrying pipe, means for revolving all the scrubbing brushes, a water spray pipe near the top of the wash plate, for finally washing all the chemical and residue from the cloth, means for finally drying the latter and winding the same in continuous form on a final winding roller, and means for advancing the cloth through the washing, developing and drying unit.

7. In a machine for producing continuous printed and developed sensitized tracing cloth, a washing, developing and drying unit having a frame, a plurality of preliminary washing pans, a chemical reducer pan and a subsequently operated washing pan, an idler roller located between the chemical reducer pan and the last-named washing pan, for lengthening the time of the chemical action on the cloth, a vertically disposed wash plate on the front of the unit frame, a plurality of lower horizontally mounted scrubbing brushes on the front of the unit frame for scrubbing the cloth subsequent to its passage through the last-mentioned washing pan, a transversely positioned pipe mounted on the unit frame and adapted to spray chemical reducer fluid on the ascending portion of the cloth being treated, an upper horizontally mounted scrubbing brush carried on the front of the unit frame for scrubbing chemical from the cloth, after the action of the chemical spraying pipe, means for revolving all the scrubbing brushes, a water spray pipe located between the wash plate and the rear surface of the cloth to prevent adherence of the cloth to the wash plate, and a large water spray pipe near the top of the wash plate for finally washing all the chemical and residue from the cloth, means for finally drying the cloth comprising a pair of exteriorly mounted rollers on the frame of the unit for extending the air circuit travel of the cloth, and a plurality of staggered heated rollers mounted within the framework of the unit, means for operating the drying rollers, and winding said cloth in a continuous form on a final winding roller within the frame of the unit, and means for advancing the cloth through the washing, developing, and drying unit.

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