

1960's

Reduction Camera for Photomask Manufacturing

~ Equipment & Materials Table of Contents ~

Fabrication of photomasks used for the contact exposure method were done in the following steps: ① Create an artwork (original drawing) in the 100x to 400x size by cutting out a pattern from a red sheet called ruby paper (Fig. 1), ② create an reticle (original plate) in the 10x size from this artwork original pattern using a reduction camera, and ③ transfer this reticle pattern in 1/10 size on the photomask plate with photosensitive resin on it by the photo-repeater.

The reticle ② is formed by irradiating with green fluorescent light from the back of the artwork of ruby paper prepared in ① and photographing it to the size of 10 times precisely on the reticle substrate with the reduction camera. The first reduction camera was manufactured by GCA. The Dainippon Screen (current SCREEN Holdings), which was manufacturing cameras for film engraving printing, developed a precision reduction camera of suspension type (Ambassador C-59) for semiconductor fabrication in response to HP's request in 1966 (Figure 2). They were used by major semiconductor manufacturers in the United States and were also widely used by Japanese semiconductor manufacturers as well.



Figure 1 Artwork for Photomask Design

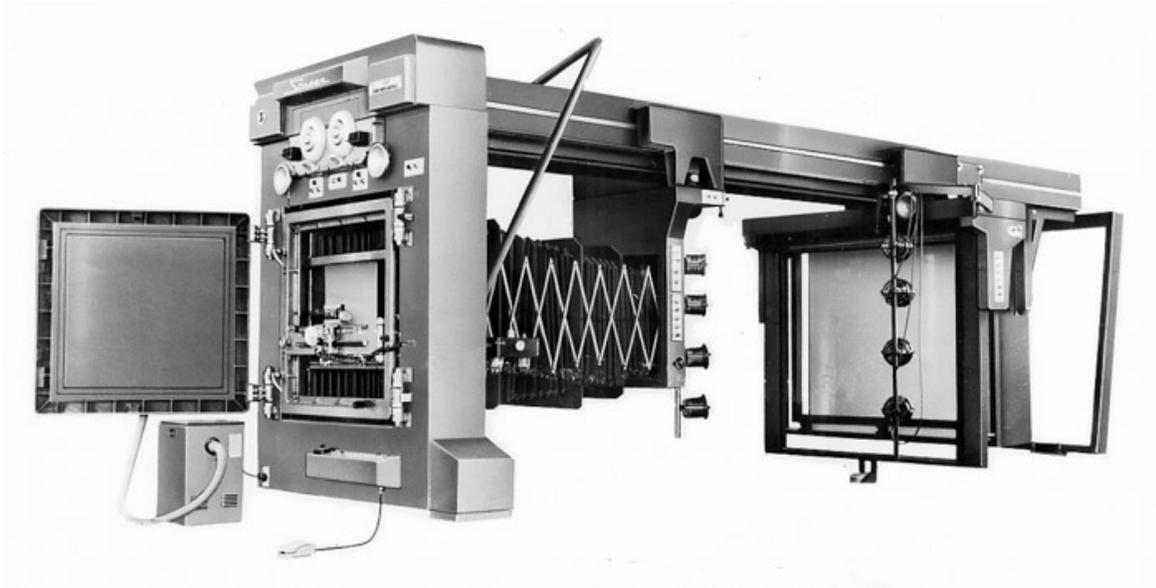


Figure 2 Redaction Camera for Photomask (Ambassador C-59)
(provided by SCREEN Holdings Co. Ltd.)

Version 2022/5/11