THE DOUBLE-SIDED LIGHT BLEACHING BANK

by Cathleen Baker

To improve the light bleaching system in the Art Conservation Department paper conservation laboratory, a transmitted light table and transparent bleaching trays were constructed to be used with an existing overhead light bank. This apparatus allows for the simultaneous light bleaching of both sides of a paper artifact, or either the recto or the verso of an artifact. At times, it is advantageous to be able to light bleach both sides of a piece of paper at the same time, thereby reducing immersion times significantly - sometimes by as much as 50%. More information on the use of this light bleaching system and an extensive bibliography can be found in the article, "Considerations in Light Bleaching Art on Paper," co-authored by Susan Duhl and myself. This paper is to be published in the proceedings of the 1985 Oxford Conference sponsored by the Institute of Paper Conservation, London, England.

The existing upper light bank was designed and built by F. Christopher Tahk some years ago for an experiment involving the light bleaching of burned oil paint.[1] In the spring of 1985, Marc Harnly constructed the double-sided light bank incorporating this earlier light bank as the upper light source (see Figures 1 and 2). The number of fluorescent tubes in the upper light source was increased from eight to fourteen.[2] The types of tubes previously used in this bank were either Sylvania Cool White or General Electric Power Groove Cool White, and these were replaced with Norelco, F40D/RS/EM, Daylight, 35 watts/tube.[3] This Daylight tube was chosen because the spectrum output is better for safer and more efficient light bleaching - more visible light output and less ultraviolet radiation.

The new lower light bank also consists of fourteen, Norelco Daylight tubes. It was built into an existing table which was modified for this

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[1]Christopher Tahk, "The Recovery of Color in Scorched Oil Paint Films," Journal of the American Institute for Conservation Vol. 19, No. 1 (Fall 1979): 3-13.

[2]Cathleen Baker, "Practical Methods for Sun and Artificial Light Bleaching Paper," AIC Book and Paper Group Postprints, American Institute for Conservation: Washington, D.C., (1982), pp. 14-15. Correction on page 15: General Electric 100 watt F48 (not 84) PG17-CW Power Groove Cool White fluorescent lamps.

[3]Norelco, 330 Lynnway, Lynn, MA 01901, USA. Phone: 617-599-7500.

purpose. The Formica table top was cut out in the center to allow a piece of 3/8 inch Lexan[4] to be set into the opening, and it is flush with the table surface.

The ballasts for the tubes are mounted onto either the top or the bottom of the tube support (1/2 inch plywood), and each of the light banks is wired separately so that either one or both may be in operation. The sides of the lower bank are left open whenever practicable to allow for good air circulation around the tubes, thus keeping the bleaching solution relatively cool.

Different sized Lexan trays, for double-sided bleaching, were constructed using methylene chloride to bond the polycarbonate together. It is important to cut the plastic to the exact size, and to smooth the bonding surfaces before attempting to solvent-weld them together. When necessary, silicone caulking is used to insure that the trays are water-tight.

To equalize the quality of the light output from the upper and lower banks, a piece of 3/16 inch Lexan was permanently fixed to the underside of the upper bank, just below the tubes. The foot candle output for each light bank is approximately 1000 fc.

When not in use, the upper light bank can be stored, with the collapsible legs retracted, on the lower shelf of the table. Without the upper light bank in place, the lower light bank also serves as a transmitted light table.

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[4]General Electric, polycarbonate #9034-112, ultraviolet stabilized grade. This grade allows virtually no transmission of radiation below 400 nm. General Electric Plastics, One Plastic Avenue, Pittsfield, MA 01201, USA. Phone: 413-494-1110.

FIGURE 1

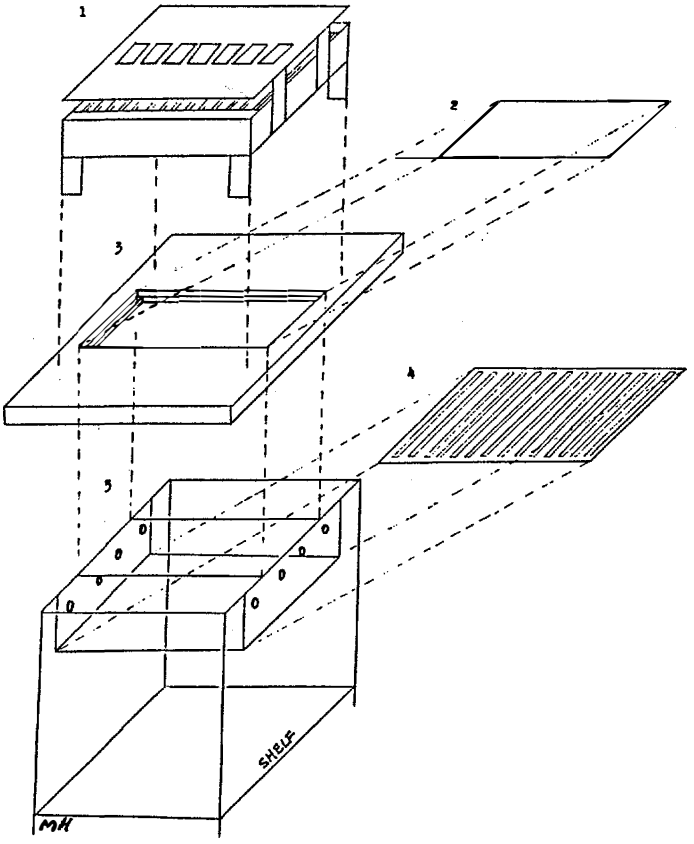
1. Upper light bank - a wooden framework to which are attached fourteen 48 inch fluorescent tubes. Underneath the tubes, a piece of Lexan is screwed to the framework to filter the light. On the top of a piece of plywood over the framework is attached the seven ballasts for the tubes. This structure rests on the table top (3) when in use. It has collapsible legs, and can be stored on the shelf under the table (5) when not in use.

2. Lexan polycarbonate sheet - the sheet fits into the well cut in the table top (3). The Lexan tray rests on this sheet during the bleaching procedure.

3. Table top - wood covered with white Formica with well cut into it to hold the Lexan sheet (2).

4. Lower light bank - a plywood board with fourteen 48 inch fluorescent tubes on top and seven ballasts attached to the reverse. The bank fits into the Dexion frame table (5) beneath the table top (3). When not in use for light bleaching, this serves as a transmitted light table.

5. Dexion frame table - plywood sideboards with holes for ventilation. Lower shelf for storage of upper light bank.



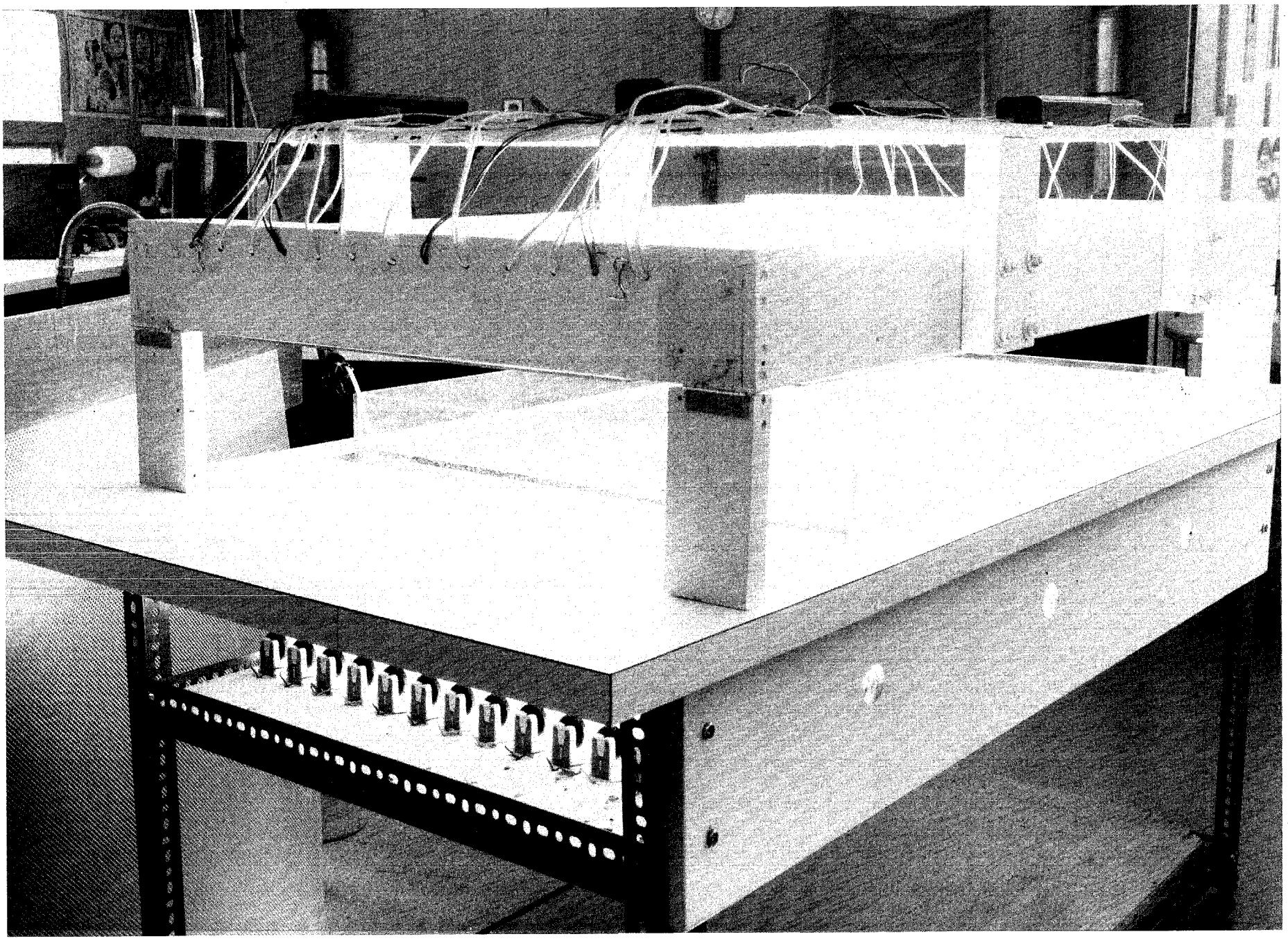


Fig. 2