Figure 13-1 Three-bucket sanitizing system. *Source*: Courtesy of Contec, Inc, www.contecinc.com.

composed of hydrophilic polyurethane foam. Other wiper materials include knitted polyester, woven cotton, and polyvinyl alcohol foam.

An example of the "three-bucket" system used to sanitize facilities is shown in Figure 13-1.

- The first bucket contains the sanitizing solution where the mop or sponge system is dipped and then the floor or other surfaced is mopped.
- The second bucket contains water for injection or the same sanitizing solution as the first bucket. After mopping the floor or other surface, the mop head is rinsed in this bucket.
- The third bucket is empty with a wringer where the rinsed mop/sponge is squeezed "dry" so that it can be effectively soaked with sanitizing solution from bucket one.

The sanitizing solution should be rendered sterile prior to use although, of course, once in use, it will no longer be sterile.

It should be noted that ultraviolet (UV) light rays of 237.5 nm wavelength, as radiated by germicidal lamps, are an effective surface disinfectant. But, it must also be noted that they are only effective if they contact the target microorganisms at a sufficient intensity for a sufficient time. The limitations of their use must be recognized, including no effect in shadow areas, reduction of intensity by the square of the distance from the source, reduction by particulates in the ray path, and the toxic effect on epithelium of human eyes. It is generally stated that an irradiation intensity of 20 $\mu w/cm^2$ is required for effective antibacterial activity.

CLEANING CONTAINERS AND EQUIPMENT

Containers and equipment coming in contact with parenteral preparations must be cleaned meticulously. New, unused containers and equipment will be contaminated with such debris as dust, fibers, chemical films, and other materials arising from such sources as the atmosphere, cartons, the manufacturing process, and human hands. Residues from previous use must be removed from used equipment before it will be suitable for reuse. Equipment should be reserved exclusively for use only with sterile products and, where conditions dictate, only for one product in order to reduce the risk of contamination. For many operations, particularly with biologic and biotechnology products, equipment is dedicated for only one product.