SLIDE TRANSFER DEVICE

BACKGROUND

Technical Field

The present invention relates generally to substrate holder devices. More specifically, the invention is related to slide transfer devices and methods of using the same.

Description of the Related Art

Pathology or histology lab equipment often have slide holders used to load microscope slides into the equipment. Slide holders for one piece of lab equipment may be incompatible with another piece of lab equipment. By way of example, a slide holder for a stainer may be incompatible for an imaging system, a piece of digital pathology equipment, or an automated slide scanner. In laboratories, slides are often transferred between baskets, cassettes, slide racks, and/or magazines to perform, for example, staining through imaging. It is difficult to transfer slides between slide holders because slide holders often have retaining features (*e.g.*, shelves) at different pitches. Slides are often manually transferred one at a time between slide holders. Unfortunately, the manual transfer process is often time-consuming, resulting in reduced lab throughput. Additionally, slides can break or otherwise be damaged if mishandled.

BRIEF SUMMARY

According to a first aspect of the present application, there is provided a microscope slide transfer device, comprising: a housing defining a chamber; a plurality of slide carriers positioned in the chamber, the slide carriers having respective slide receiving openings; and an adjustable spacing mechanism coupled to the housing, the adjustable spacing mechanism including an actuator, a drive apparatus coupling the actuator to the plurality of slide carriers, the drive apparatus is configured to move the slide carriers relative to one another along the chamber as the actuator is moved relative to the housing, wherein the actuator is movable between a first position and a second position, the plurality of slide

carriers define a first average pitch when the actuator is in the first position and the plurality of slide carriers define a second average pitch when the actuator is in the second position.

According to a second aspect of the present invention, there is provided a microscope slide holder device, comprising: a housing; a plurality of slide carriers; and a drive apparatus coupled to the plurality of slide carriers and the housing, the drive apparatus having a first state and a second state, the slide carriers are stationary relative to one another when the drive apparatus is in the first state, and the slide carriers move away from one another when the drive apparatus is in the second state, wherein the drive apparatus is capable of moving adjacent slide carriers away from or towards one another.

According to a third aspect of the present invention, there is provided a method of moving microscope slides from a first slide holder to a second slide holder, the method comprising: simultaneously transferring a plurality of slides from the first slide holder into respective carriers of an adjustable slide holder device while the carriers define a first average pitch; moving the carriers relative to other such that the carriers define a second average pitch that is different from the first average pitch; and simultaneously transferring the microscope slides from the carriers to respective slide holding features of the second slide holder while the carriers are at the second average pitch.

At least some embodiments are directed to a holder device that includes a housing and a plurality of carriers. A spacing mechanism can change the spacing between adjacent carriers to move the carriers to any number of desired spatial arrangements. The carriers can be configured to hold items in the form of substrates (*e.g.,* microscope slides, coverslipped microscopes slides, or the like) or other items for holding sample(s) or specimen(s). In certain embodiments, the carriers are dimensioned to hold specimen-bearing coverslipped slides. For