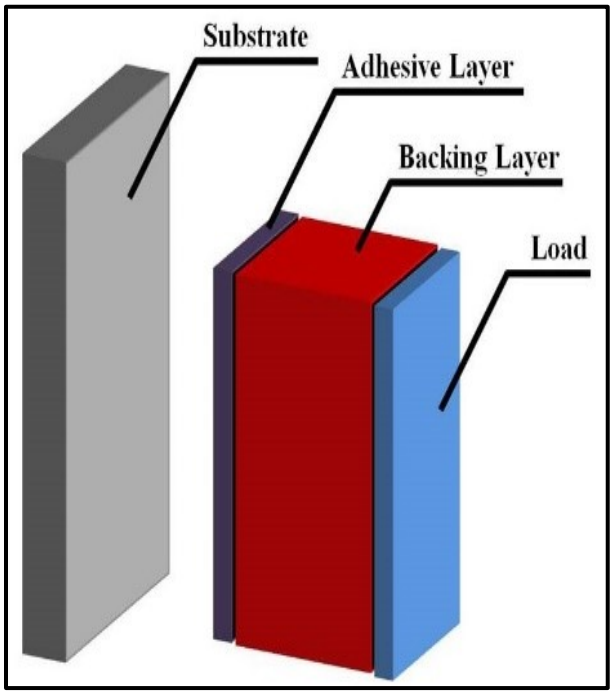
REVERSIBLE ADHESION SYSTEM
(RFT-460)

Invention Summary:

There is a need for a reversible adhesion system that works without peel or stretch. Recently it was demonstrated that the force capacity of an adhesive depends on the rigidity of the adhesive material used. Researchers at NDSU have developed a general method to control the stiffness of the material, enabling a switchable adhesive system for low and high adhesive state. This method allows the concept of repeatable adhesion of sticky notes to be applied to more rigid materials such as plastic, glass, metal, wood or composites. The NDSU technology is focused on the backing layer of the adhesion system. This allows the technology to be incorporated with existing reversible adhesives without the need to modify the adhesive layer chemistry. This technology can easily be customized to operate on a variety of surfaces and supplement immediate customer needs.



Benefits:

- Enable multiple rounds of adhesion and release of rigid items.
- Suitable for a variety of surfaces such as walls, ceilings, floors, shelves, etc.
- Ease of application
- Compatible with currently available 'releasable' adhesives
- Compatible with a wide range of backing materials
- Suitable for short- and long-term attachments

Phase of Development:

This technology has successfully completed laboratory testing with reproducible results.

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Example of 'Switch' mechanism:

In theory, this could be implemented using any process that changes a backing between more rigid and less rigid states. A few examples:

- A frame that creates and reverses rigidity by pulling edges of a backing material
- A frame that switches from locked 90° corners (rigid) to a diamond shape (flexible)
- Filling an inflatable backing with liquid or air

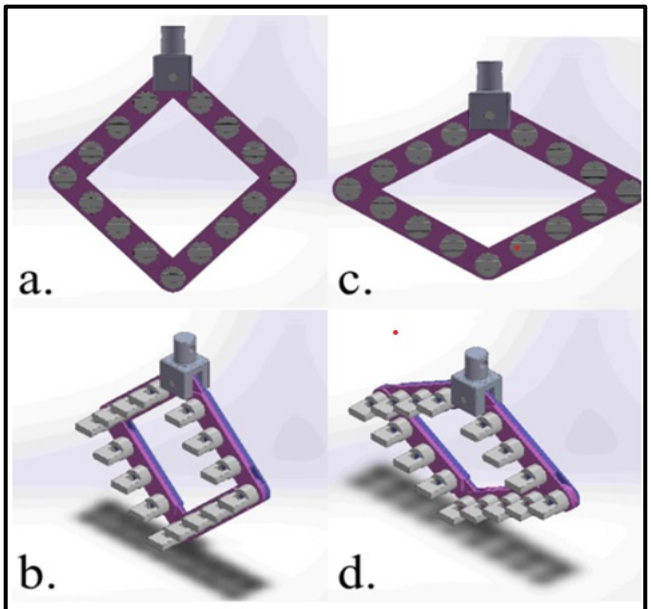

Figure: Schematic of "picture frame" device.
a. and b. depict the device fixed in the high force state.
c. and d. depict the device fixed in the low force state, the frame compresses and deforms the adhesive

Patents:

This technology is the subject of US Patents No. 7,544,722 is available for licensing and partnering opportunities.

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