

Removing Modern Accretions: Hot-Melt Adhesive, Chewing Gum, and Pressure Sensitive Tape

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INTRODUCTION

This poster describes three conservation treatments in which modern thermoplastic materials were removed from fibers at the Smithsonian Institution's National Museum of the American Indian (NMAI). The treatments were undertaken in preparation for the *Circle of Dance* exhibition, which opened at NMAI- NY, October 2012. During examination of two outfits, three types of accretions were discovered well-adhered to fibrous components. Following literature searches, trials, and an evaluation of previous treatments at NMAI, each of these materials was removed with a different method, using varying combinations of mechanical action, temperature change, and solvent application.

MEN'S NORTHERN TRADITIONAL POWWOW OUTFIT – BEADED CUFF (26/7485)

Object: Cuff with overall beaded geometric design. Beads applied to rubberized flannel with lane stitch technique using nylon beading thread. Cotton canvas lines the interiors and woven green bias tape binds the edges. Cream-colored leather fringe is adhered and stitched to the bottom edges. Foil-coated plastic sequins are stitched to the exterior of the green binding.

Modern accretion: Hot-melt adhesive, also known as hot glue, was accidentally transferred to the bias tape at the cuff edge when the storage mount was made. Molten adhesive had saturated some areas of the woven tape before it had cooled.

Treatment: 1) Excess adhesive was mechanically reduced using tweezers, scissors, and a scalpel under magnification. 2) Hollytex strips were laid over the remaining adhesive and heated with an Ersa hot spatula. The Hollytex was pulled away as soon as molten adhesive moved into it. This step was repeated with clean Hollytex until no further adhesive moved out of the fabric. 3) Residual adhesive was blotted away with a 1:1 mixture of toluene and methyl ethyl ketone, applied on cotton swabs using a rolling action.



Beaded cuff, before treatment overall. Inserted image is after treatment.



Hot-melt adhesive on bias tape. Before treatment.



Hot-melt adhesive after mechanical reduction.



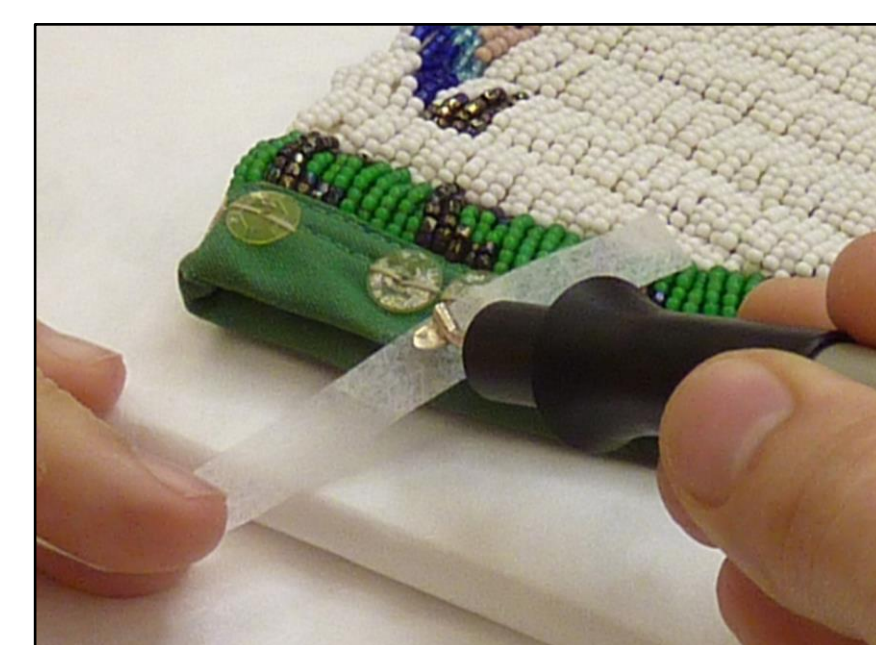
Hot-melt adhesive after reduction using Hollytex and a heated spatula.



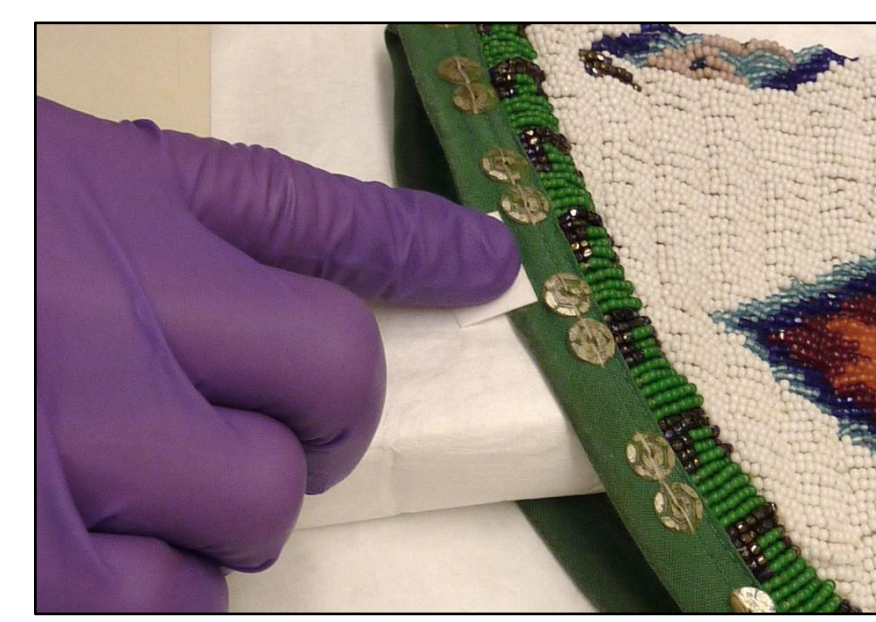
Hot-melt adhesive after solvent reduction, the final treatment step.



Hot-melt adhesive reduction using a scalpel under magnification.



Hot-melt adhesive reduction using Hollytex and a heated spatula.



Blotting away solvent mixture in final step of reducing hot-melt adhesive.

MEN'S NORTHERN TRADITIONAL POWWOW OUTFIT – BACK APRON (26/7485)

Object: Apron constructed from dark-green, woven full wool fabric with a rainbow selvage at the bottom edge. Gold lamé bias tape is bound to the side edges with machine stitching. Shoe lace ties are positioned through holes in the top corners.

Modern accretion: A gummy accretion, that appeared to be chewing gum, was embedded in the wool fabric and gold lamé binding. The accretion had probably transferred to the apron while worn during a powwow.

Treatment: 1) The accretion was embrittled by localized temperature reduction using bagged ice over a blotter barrier. 2) The accretion was mechanically reduced with a Teflon-coated scraper, followed by stainless steel scrapers and probes. 3) Stoddard solvent was applied with cotton swabs to further reduce the tenacious accretion. Solvent solubilized the accretion, however it also mobilized it further into the fabric and this step was aborted. 4) The object was placed in the freezer overnight and once removed the accretion was further reduced mechanically as in step 2. These steps were moderately successful but the textile and accretion rapidly returned to room temperature, limiting treatment progress. 5) Dry ice (solid carbon dioxide) was employed to embrittle the accretion. The dry ice was applied directly to the surface of the apron, as well as with a barrier of blotter and silicone release Mylar. Although both methods worked, direct application was preferred. 6) The hardened accretion was reduced mechanically, as in step 2. 7) The resulting crumbs from the gum were vacuumed using a low-suction vacuum cleaner.



Back apron, before treatment, overall.



Applying dry ice directly to an accretion, as in step 5.



Mechanically reducing the accretion, as in step 2.



Detail of back apron, before treatment.



Detail of back apron, after treatment.

YUP'IK DANCE FAN (25/8687)

Object: Dance fan made of dyed and undyed coiled beach grass and caribou chin hair. The caribou hair remains attached to hide that is hand sewn to the outer coil.

Modern accretion: Black pressure sensitive tape had become attached to both the long guard and shorter underfur caribou hairs on the fan before it was accessioned by NMAI. Adhesive residue from the tape was also present on the surface of the coiled grass element. The tape appeared to be black photo tape with a paper carrier.

Treatment: 1) Dry ice (solid carbon dioxide) was applied directly to the paper side of the tape, while loose hairs were held aside. As water crystals formed on the adhesive side of the tape, the dry ice was removed. 2) About 10 seconds later, the white guard hairs were gently lifted from the tape using a Teflon dental tool. 3) Once all the guard hairs were removed, the brown underfur hairs were lifted as in step 2. Black adhesive residue remained on the caribou hairs, which appeared to be the same black adhesive residue that was present on the beach grass. 4) Residual adhesive on the caribou hairs and beach grass was reduced further using GroomStick, while working under magnification. Small balls of GroomStick were attached to the tips of bamboo skewers and gently wiped across the surface of the hairs and beach grass.



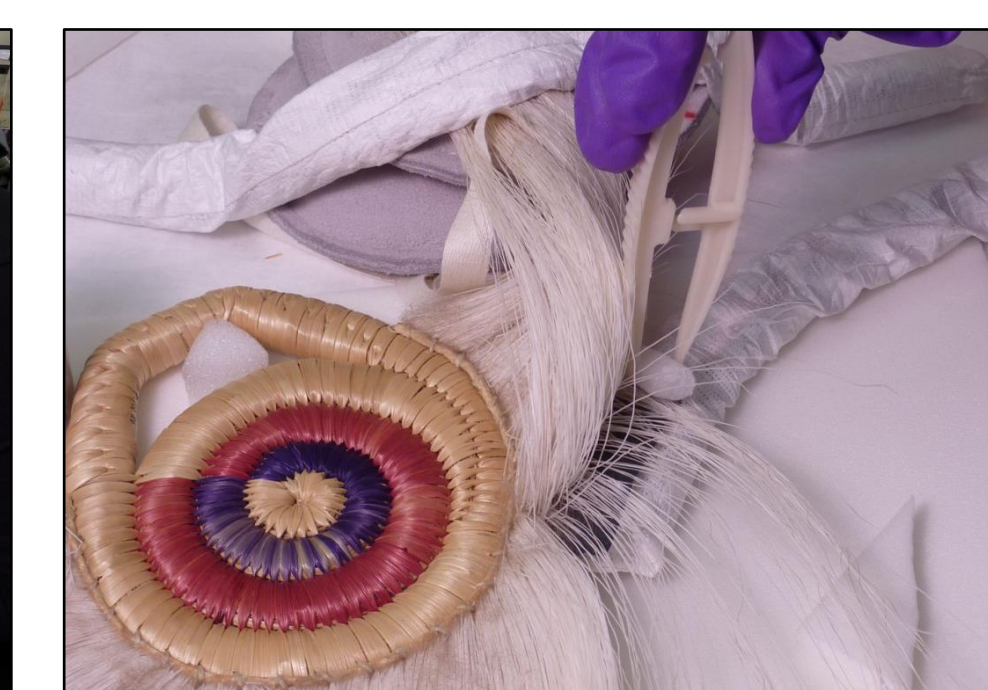
Yup'ik dance fan. Before treatment, overall.



Yup'ik dance fan. After treatment, overall.



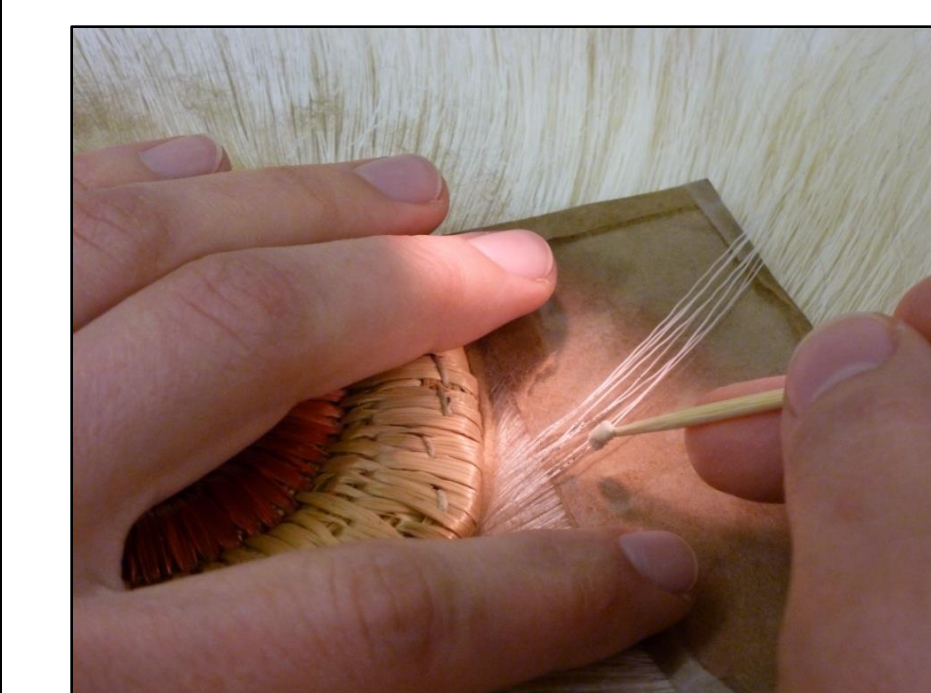
Initial trials using dry ice to remove the pressure sensitive tape.



Applying the dry ice to the tape.



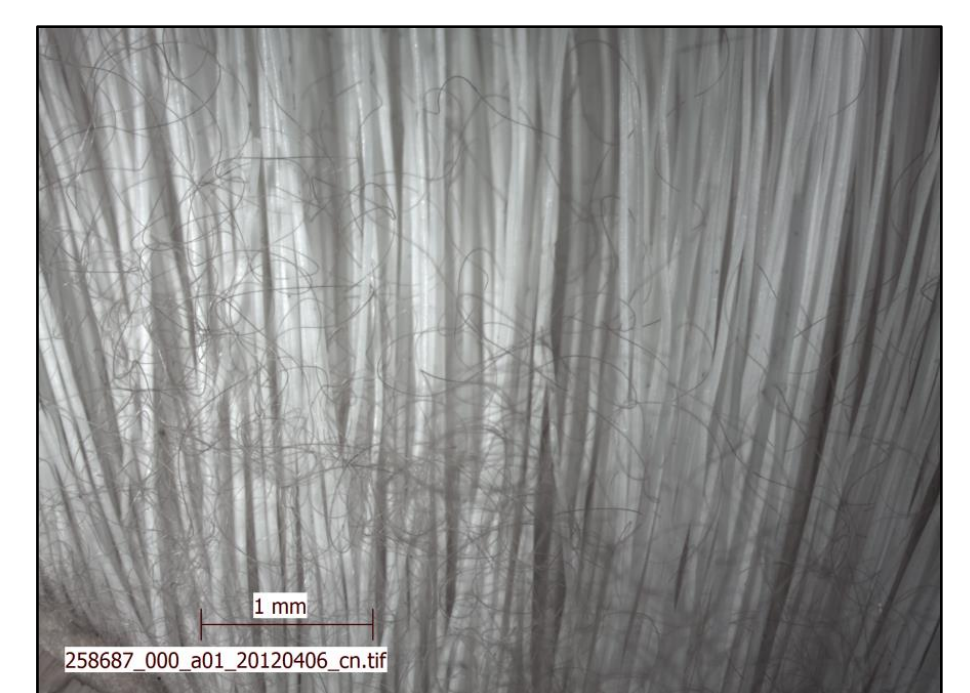
Gently lifting the hairs from the adhesive side of the tape with a dental tool.



Removing adhesive residue using GroomStick.



Caribou hair with adhesive residue. During treatment.



Caribou hair after reduction of adhesive residue. After treatment.

CONCLUSION

The conservation treatment of these outfit components raised issues in reducing three modern thermoplastic materials, which are all notoriously difficult to remove. These treatments point out that trials are vital to developing treatment protocol, such as establishing timing during temperature change applications. The treatments successfully reduced the accretions from the fibrous substrates with minimal alteration to the objects, greatly improving their overall appearance and condition. In all three cases, mechanical action was found to be the only method for reduction without driving the accretion further into the fibers; heat and solvent were used sparingly. While great care was taken to avoid damage to the fibers or hair loss, the accretions and subsequent treatments have imparted some permanent changes to these objects. For example, a haze of adhesive residue can still be seen on the beaded cuff and back apron and there was slight hair loss on the Yup'ik dance fan. Some residue and loss are deemed acceptable; accretions left in place could potentially attract soils or cause other physical harm. These treatments honored the original aesthetic intent of these objects and enabled display.

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MATERIALS

- Dry Ice.** Manufacturer: Continental Carbonics. Supplier: Roberts Oxygen Company.
- Groomstick.** Manufacturer: Picreator Enterprises Ltd. Supplier: University Products.
- Hollytex.** Manufacturer: Ahlstrom Filtration Inc. Supplier: Archival supplies vendors.

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