Recommended resources:

Louise Coffey-Webb. Managing Costume Collections, An Essential Primer. Texas Tech University Press. 2016. To purchase: amazon.com or CSA website if a member (https://csoa.memberclicks.net/).

Margaret T. Ordonez. Your Vintage Keepsake. A CSA Guide to Costume Storage and Display. Texas Tech University Press. 2001. To purchase: amazon.com or CSA website if a member (https://csoa.memberclicks.net/).

National Park Service Conservograms – free downloads:
https://www.nps.gov/museum/publications/conserveogram/cons_toc.html

Canadian Conservation Institute Notes – free downloads:
https://www.canada.ca/en/conservation-institute/services/conservation-preservation-publications.html

American Institute for Conservation website: https://www.culturalheritage.org/
Find a Conservator tool on the home page
Collections care resources: https://www.culturalheritage.org/resources/collections-care

Series of 6 podcasts from the Minnesota Historical Society: Conservation and Preservation of Heirloom Textiles, now on YouTube:
https://www.youtube.com/watch?v=WBo2G18y74A&list=PLC43D3C807A39A3FC

PDFs included below:

- NPS Conservogram 04-05: Padded Hangers.

-CCI Note 13/5 – hanging storage

- PHILADELPHIA MUSEUM OF ART COSTUME & TEXTILES STORAGE AND HOUSING MOUNTS by Jackie Peterson.

- Making a Stockinette

- Multiple articles from Museum Mannequins for hat storage/mounts. Ed. By Margot Brunn and Joanne White.

Suppliers

-Boxes and acid-free tissue (unbuffered!): Hollinger: https://www.hollingermetaledge.com/. Hollinger has non-buffered boxes. Most other companies only carry the buffered versions. 20% sale at least 3 times per year.

-Padded hangers: https://hangerbee.com/collections/hangerbee-padded-hangers - there are various sizes and kits to make your own, prices are close to actual cost to make.

-clamp pant hanger as seen in Philadelphia pdf: Honey-Can-Do 12-pk. Soft-Touch Clamp Pants Hangers – google search for best price

-muslin and needle-punch (non-adhesive) batting: Joann.com. Usually has 40% coupon online.

-Stockinette: https://www.promed-inc.com/product-page/tubular-gauze (one option via medical supply)

Always wash the muslin and stockinette before using it!

- hat mounts: Gaylord: https://www.gaylord.com/Preservation/Textile-Preservation/Storage-Boxes/Gaylord-Archival%26%23174%3B-Hat-Mount-Stands-%286-Pack%29/p/HYB00835 or you can see how it works and make your own. Once padded out, they are an affordable option to ethafoam.

NATIONAL PARK SERVICE
DEPARTMENT OF THE INTERIOR

Conserve O Gram

July 1994 Number 4/5

Storage Techniques For Hanging Garments: Padded Hangers

Historic garments require special consideration for their safe storage. The garments in most costume collections are suspended from hangers. Hanging may be appropriate for pieces in good condition; however, fragile costumes should be stored flat in customized boxes or in drawers of dust-tight cabinets.

When garments hang vertically, stress concentrates on the upper body sections, such as the bodice, shoulders, and neck. Appropriate storage techniques should minimize distortion to the fabric and reduce tension on the seams. A specially made hanger, padded to conform in shape to the cut and style of the costume, will help to minimize these stresses. Dresses with heavy skirts need additional support from the waistline to the hanger to relieve the strain created by the skirt.

The Hangers

Collection managers must customize commercially available wooden hangers by padding and wrapping them with polyester batting. The batting enlarges the size of the hanger and provides a cushioned support for the garment. The wrapped hanger is protected with a cotton cover that removes easily for washing. The hanger assembly may be sewn by hand or with a sewing machine.

It is best to have a variety of sizes and types of wooden hangers on hand to suit individual garments. The simple single bar hanger is sturdy and can be shortened easily if the ends are too wide. (See Figure 1.) The triangular hanger without a metal clamp on the rod will be useful as well. (See Figure 2.) Look for hangers with long-necked metal shafts since it is very important that the garment does not rest high on the hanger and touch the hanging bar of the storage cabinet. The hangers will need to be sealed with a coat of shellac to inhibit outgassing of volatile wood acids (be sure shellac is used by the date stamped on the can).

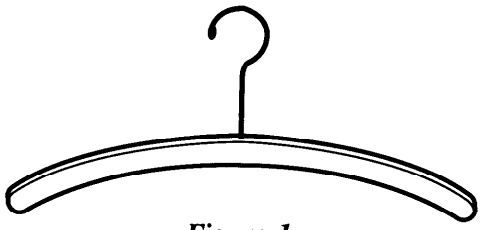

Figure 1

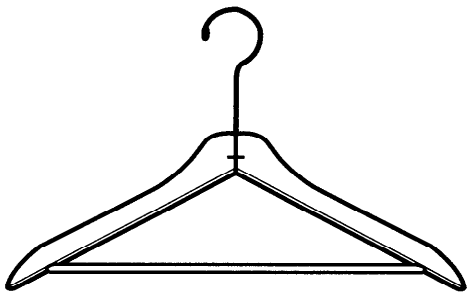

Figure 2

Materials

All materials used to make padded hangers can be obtained from local fabric, variety, and hardware stores. Parks can order some of these through NPS *Tools of the Trade*.

- 100% cotton muslin, washed
- Matching colorfast thread
- 100% cotton twill tape, one inch wide
- Needlepunched polyester batting
- Soft, unbuffered, acid-free tissue
- Wooden hangers with long necks

- Scissors
- Pins and needles
- Sewing machine, if available
- Arm & Hammer® or Cheer Free® detergent

Consult the NPS *Museum Handbook*, Part I (Rev 9/90), Appendix K, pages 31-34, for additional information on the storage of hanging garments.

Preparation of the Materials

Before the cotton muslin is used, it must be washed in hot water with detergent (Arm & Hammer or Cheer Free) to remove sizing or finishes and to allow the fabric to shrink. The cloth should be put through a second cycle in the washing machine without detergent. When hand washing, rinse repeatedly because it will be in long-term contact with the costume. Allow the fabric to dry flat and press out the wrinkles with an iron.

Before starting to pad the hanger, size it to the garment. Anticipate that the padding will increase both its width and height. If possible, use needlepunched polyester batting, manufactured by a process that does not use resins. Cotton batting will compress over time but the polyester padding will maintain its loft (height). The thickness of the batting will determine how many strips of padding have to be cut. The purpose of the padded hanger is to provide cushioned support and relieve stress on the garment wherever possible.

Single Bar Hangers

- Cut a piece of batting which is at least 5 inches wide and long enough to extend beyond the ends of the hanger.

- Make a small hole in the middle-center of the batting and slip it over the hanger. (See Figure 3.)

- Wrap narrow strips of batting around the hanger until it becomes a rounded form without sharp ends. (See Figure 4.)

Baste additional batting in place where needed. (See Figure 5.)

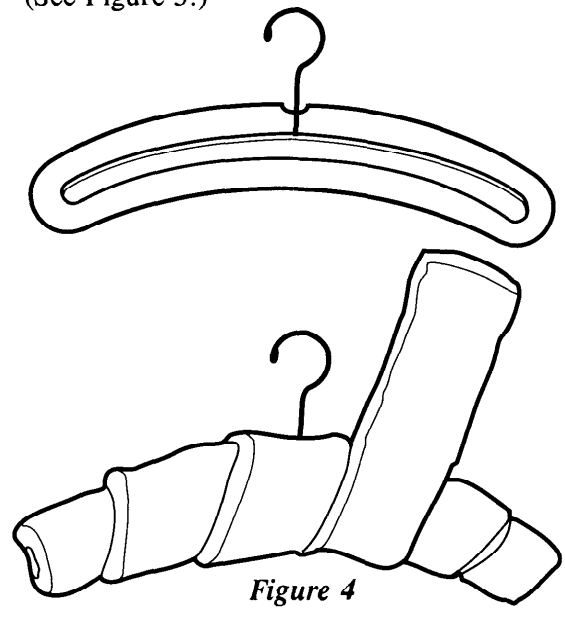

Figure 4

- Create a paper pattern by tracing around the padded hanger, increasing its dimensions by one inch.

- Square off the bottom edge.

- Cut two pieces of muslin using this pattern.

- Turn under bottom edge ¼-inch and hem.

- With the hems to the outside, sew a seam along the top of the pattern from A to B as marked on Figure 6.

- Leave a one inch gap in the center for the hook to go through.

- Turn the cover inside-out and place it over padded hanger. (See Figure 6.)

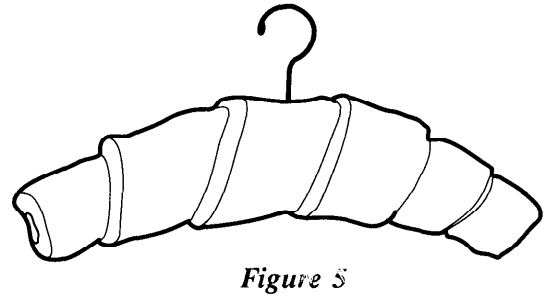

Figure 5

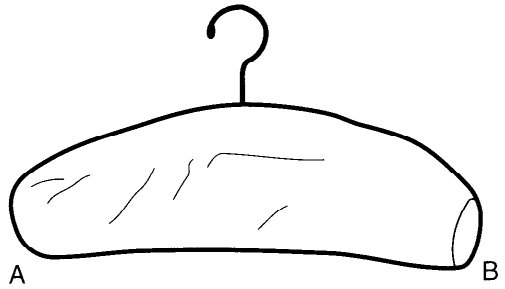

Figure 6

Triangular Hangers

- Cut the batting ½-inch larger than the pattern provided on page 4. (See Figure 9.) The increase in size permits the fabric to be shaped to the contour of the hanger. Cover the hanger with the batting and baste it in place with thread.
- Additional padding may be needed to round out the ends of the hanger, conforming it to the shape of the garment.
- Cut, arrange, and sew additional pieces of batting where the garment needs the most support. (See Figure 7.)
- Be careful not to pad too closely to the metal hook since the garment should not ride too high on the hanger.
- Using muslin and the enlarged pattern, make the cover for the hanger. Fold the selvedges of the muslin together, place the fold of the fabric on the fold line of the pattern, and pin.
- Cut two pieces of fabric in this manner.
- Turn under ¼-inch, hem the straight edge of each piece.
- With right sides together (the hemmed section to the outside), sew the two pieces together using a ½-inch seam allowance.
- Leave a gap in the stitching at the center top where the metal hook will pass through the cover (marked by an X in the pattern).
- Turn the cover and place over the prepared hanger. (See Figure 8.)

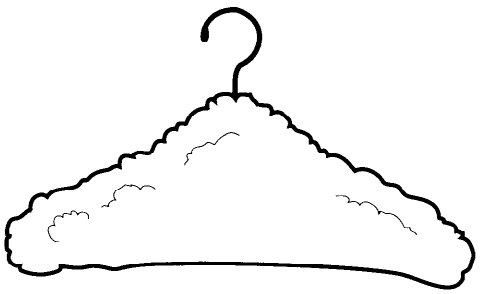

Figure 7

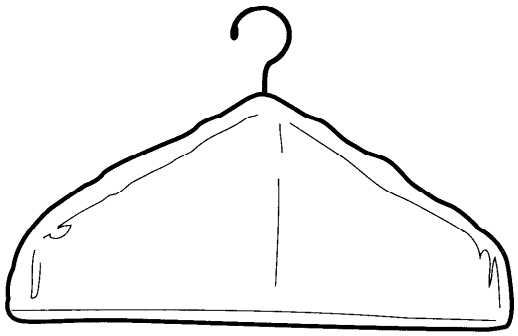

Figure 8

Additional Support

For particularly heavy garments or dresses with bustles, supplementary support of the garment to the waist from the hanger may be necessary. Using a needle and thread, securely stitch lengths of one-inch-wide cotton twill tape to seam allowances or strong areas of the waistband on the garment. Tie the tapes to the hanger's wire neck, adjusting the lengths of the tape so they provide adequate support. The twill tape may stretch over time as the garment hangs and may need to be adjusted periodically. Use as many twill tapes as necessary to support, but not distort, the skirt. Additional interior support may be needed, depending on the construction of the garment. Stuff sleeves, support collars and fill spaces where necessary with soft, crumpled unbuffered, acid-free tissue.

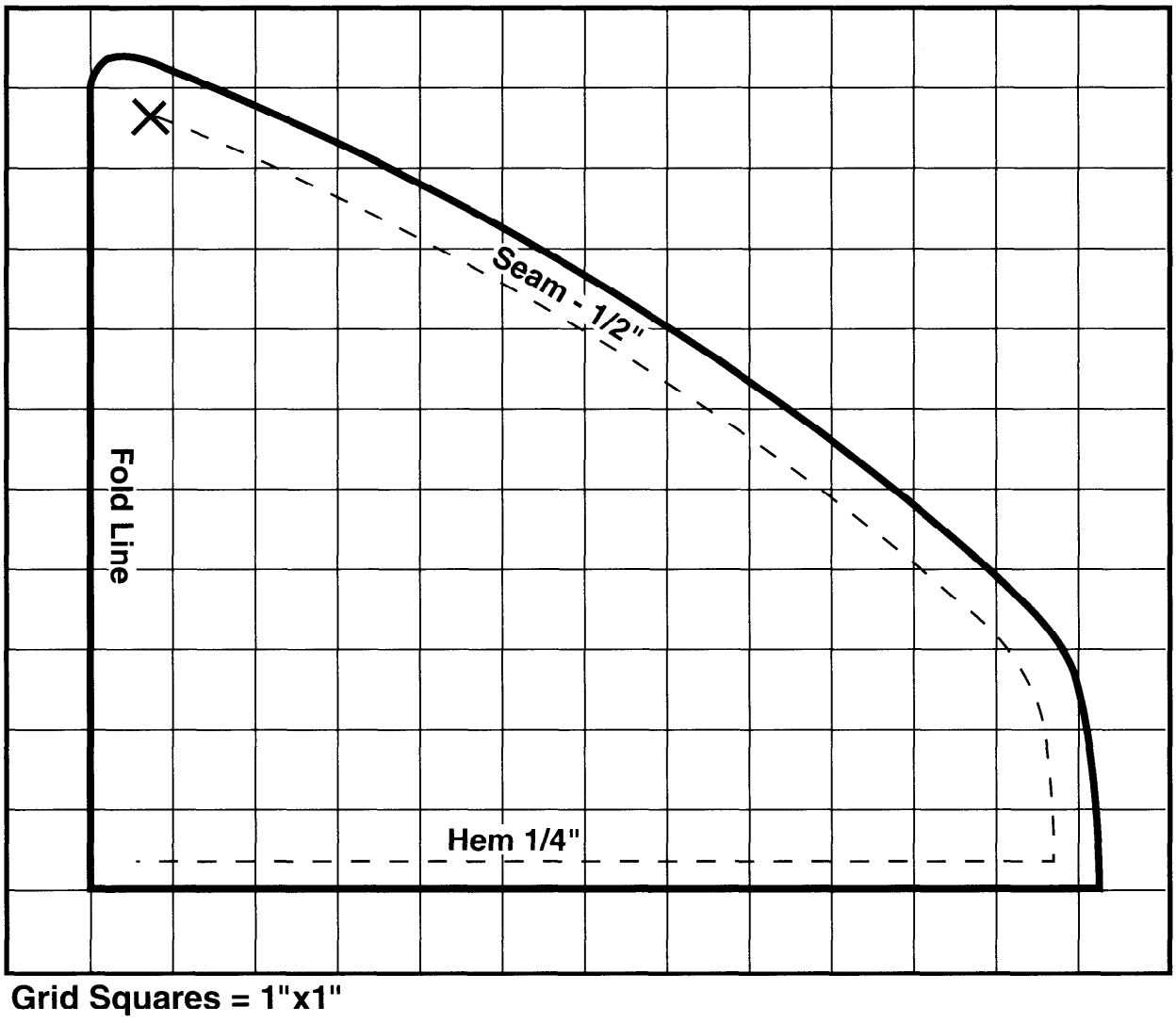

Figure 9

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Canadian Conservation Institute
Institut canadien de conservation

CCI Notes 13/5

Hanging Storage for Costumes

Introduction

Structurally sound costumes are often stored by hanging. Although this is an excellent space-saving storage method, it is not suitable for all garments. Costumes that are fragile, that are heavily decorated, or that have weakened shoulder seams due to previous incorrect hanging should be stored flat rather than hung. As well, avoid hanging knits and bias-cut costumes. Further information on storage can be found in CCI Notes 13/2 *Flat Storage for Textiles*.

Preparing the Textile for Storage

Before placing a textile into storage, examine it thoroughly for any sign of insect infestation or mould. If either of these conditions is detected, place infested textiles in sealed, clean, polyethylene bags and isolate them from the rest of the collection. Further information on insect infestation or mould is available in the following CCI publications: CCI Notes 3/1 *Preventing Infestations: Control Strategies and Detection Methods*; CCI Notes 3/2 *Detecting Infestations: Facility Inspection Procedure and Checklist*; CCI Notes 3/3 *Controlling Insect Pests with Low Temperature*; CCI Notes 13/15 *Mould Growth on Textiles*; Technical Bulletin No. 12 *Controlling Museum Fungal Problems*; and Technical Bulletin No. 26 *Mould Prevention and Collection Recovery: Guidelines for Heritage Collections*. If you have further questions, contact the Canadian Conservation Institute for advice.

Remove paper wrappings other than acid-free tissue, especially coloured paper from which dyes could transfer. Before discarding wrappings or attachments such as old accession numbers or dry-cleaning tags, examine them for information that should be documented. Retain and store separately the original packaging material.

Remove pins and staples. These put stress on the fabric and are almost certain to rust. Isolate any corroded metal fasteners by covering them with acid-free tissue or with clean white cotton.

Textiles should be clean when stored. Soil invites infestation, which can endanger the entire collection. Unless textiles are in a very fragile condition, they can be safely surface cleaned by gentle brushing and by vacuuming through a screen. If necessary, white cotton or linen textiles in sound condition may also be washed (see CCI Notes 13/7 *Washing Non-coloured Textiles*). Whenever possible, give additional interior support to costumes; for example, put crumpled, unbuffered, acid-free (neutral pH) tissue paper in sleeves.

Preparing Hangers

To hang costumes according to museum standards, wooden or plastic hangers are often cut to size and adapted by padding to suit individual garments. The aim is to give support in such a way as to minimize stress on the textile.

It is best to work with a variety of wooden or plastic hangers. Use the style and size of hanger most easily adaptable to the garment. Clothing stores will often donate a few hangers for museum collections.

Do not use lightweight wire hangers. They do not adequately support the garment.

Pad the hanger with polyester or cotton quilt batting to round it to a wide and cushioned form with no sharp edges. This will allow the weight of the garment to be evenly distributed over the shoulder area (Figure 1). Then sew a prewashed cotton cover over the padded hanger. The cover can be machine stitched along the top edge, fitted over the hanger and padding, and hand sewn along the lower edge (see CCI Notes 13/10 *Stitches Used in Textile Conservation* for further information).

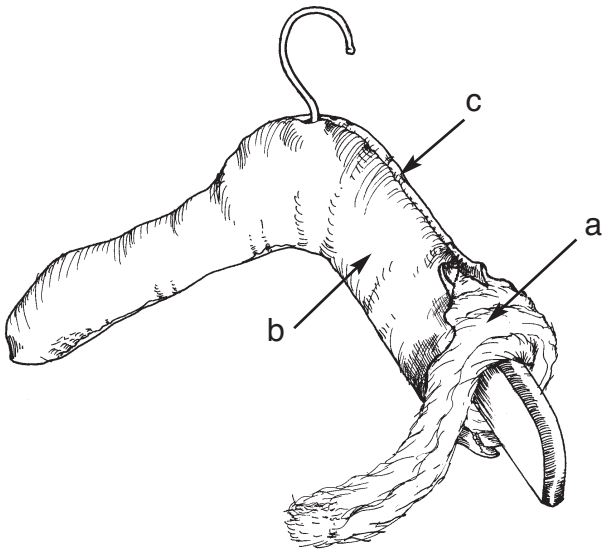

Figure 1. Padded hanger. a, polyester or cotton quilt batting; b, cotton cover; c, seam machine stitched.

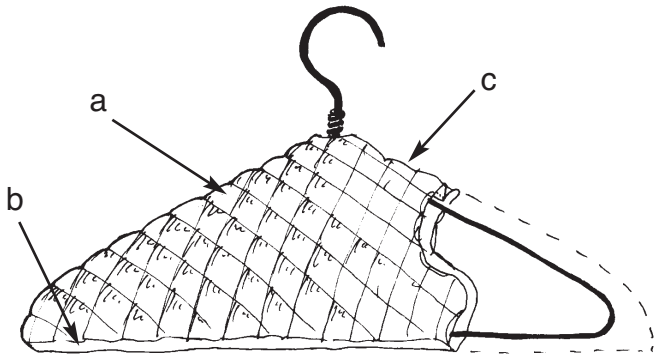

Figure 2. Padded hanger with quilted slipcover. a, quilted fabric; b, open along bottom edge; c, seam machine stitched.

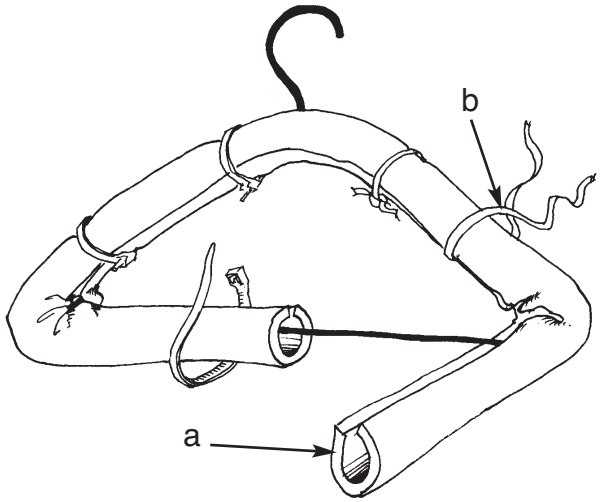

Figure 3. Padded hanger with pipe insulation. a, polyethylene pipe insulation; b, twill tape or nylon electrical ties.

Another option is to sew a slipcover of quilted cotton fabric to cover the padded hanger. This cover is machine stitched along the top edge; the bottom edge is hemmed, but left open, so the cover is removable for washing (Figure 2).

A further option for making a padded hanger is to cover the hanger with polyethylene pipe insulation. Cut a piece of pipe insulation the length of the hanger. Make a cut through one layer of the pipe insulation along its length. Place the centre of the insulation over the hook of the hanger and secure the cut edge over the sides of the hanger. Secure the pipe insulation in place with cotton twill tape or nylon electrical ties (Figure 3). Finish the hanger with a quilted slip cover.

Preparing a Padded Rod or Tube

Straight-cut garments, such as kimonos and ponchos, should not be hung from a hanger. Rather, store them flat or hanging from a padded rod or tube inserted through the sleeves. Pad the rod or tube in a similar way as the hanger: wrap it with polyester or cotton quilt batting, and then cover it with cotton fabric or cotton knit tubing (stockinette). The rod or tube should be a few centimetres longer than the total width of the garment including the sleeves at full extension. Methods for supporting the tubes are described in CCI Notes 13/3 *Rolled Storage for Textiles*.

Hangers for Skirts and Pants

Skirts and pants in sound condition can also be hung for storage. Always suspend these garments from the waist. A wooden clamping hanger can be adapted for this purpose. Line the insides of the hanger with polyethylene foam or multiple layers of microfoam. Secure the foam to the hanger with hot melt glue. Adhere white felt or a white velvet ribbon with hot melt glue over the cushioning layer to reduce slippage (Figure 4).

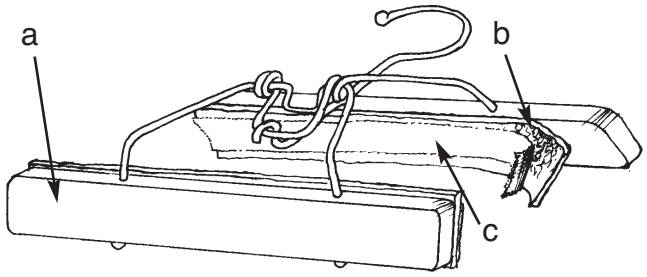

Figure 4. Skirt hanger. a, wooden pant hanger; b, polyethylene foam or microfoam; c, white velvet ribbon.

Note: To reduce the pressure from the clamping action, place a piece of 2 cm (3/4 in.) thick board between the walls of the hanger for several hours, before it is modified. This will serve to relax the clamping mechanism.

Supplementary Support

Give heavy, bulky, or awkward garments, such as period costumes with bustles, supplementary support from the waist (Figure 5).

- Lay the garment out flat on a table, and insert the specially prepared padded hanger.
- Cut two pieces of white cotton tape (1.5–2 cm wide) approximately twice the length from the waistband of the garment to the hook of the hanger.
- Sew one end of one length of tape onto one side of the waistband on the inside of the garment. Loop the tape around the hook of the hanger, and bring the other end back to the waistband. Adjust the length, and hand sew the second end into place. Repeat this procedure, sewing the other length of tape onto the other side of the garment's waistband.

Whenever possible, give additional interior support to costumes; for example, put crumpled, unbuffered, acid-free (neutral pH) tissue paper in sleeves.

Garment Dust Covers

Ideally, each costume should be protected from dust and light, and from contact with other garments, by a dust cover. This can be made from inexpensive fabric, such as prewashed cotton sheeting.

It is a good idea to wash garment dust covers periodically.

The patterns illustrated here may be adapted to fit a particular costume. The closed design is recommended for clothing that hangs near the floor (Figure 6). The open version is usually more convenient for shorter pieces (Figure 7).

The closed design is constructed as follows:

Starting 15 cm above the bottom of the fabric on one side and allowing for a 1.5 cm seam, machine stitch down to and along the bottom of the fabric and up the other side to the top. Stitch along the top, leaving a 2.5 cm hole for the hook of the hanger. Stitch 15 cm down the side. Turn the cover inside out, hem the side opening, and attach the cotton ties.

The open design is constructed as follows:

Machine stitch around the sides of the fabric, allowing for a 1.5 cm seam. Leave the bottom open and leave a 2.5 cm hole at the top for the hook of the hanger. Turn the cover inside out, and hem the lower edge.

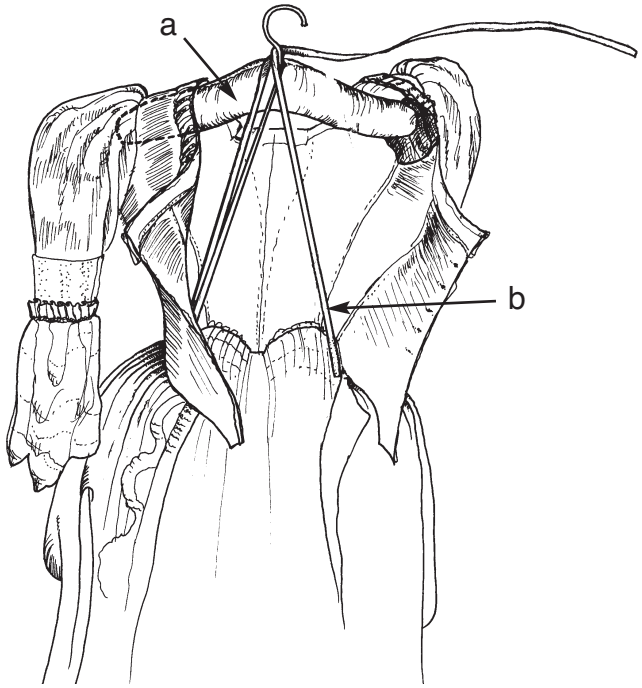

Figure 5. Using tapes for supplementary support. a, padded hanger; b, cotton tape attached to waistband.

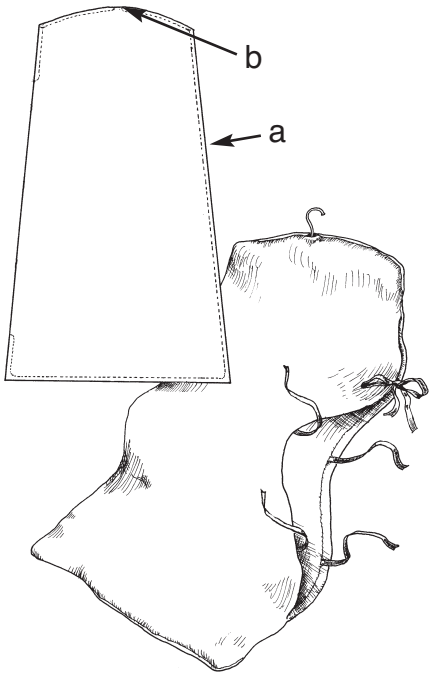

Figure 6. Closed dust cover. a, 1.5 cm seam; b, 2.5 cm opening for hook of hanger.

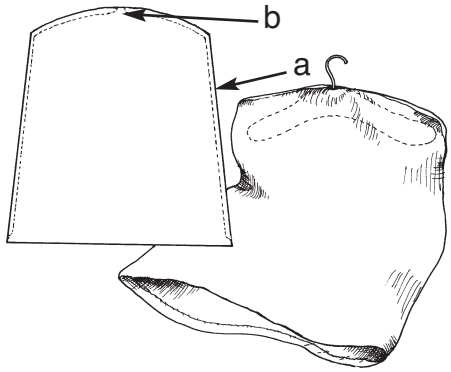

Figure 7. Open dust cover. a, 1.5 cm seam; b, 2.5 cm opening for hook of hanger.

Storage

Garments should be stored in enclosed units. If open units are the only storage facilities available, enclose them with curtains made of prewashed cotton. Garments that hang from rods in an open storage area should be draped with sheets of cotton. Always hang garments at least 10 cm apart.

To limit handling a costume in storage, attach auxiliary accession numbers to the artifact. Paper or Tyvek tags can be suspended from the storage hanger for easy identification of the costume.

For information on other storage methods, see CCI Notes 13/2 *Flat Storage for Textiles*; CCI Notes 13/3 *Rolled Storage for Textiles*; and CCI Notes 13/12 *Storage for Costume Accessories*.

Suppliers

Note: The following information is provided only to assist the reader. Inclusion of a company in this list does not in any way imply endorsement by the Canadian Conservation Institute.

Polyester or cotton quilt batting, cotton sheeting, quilted cotton fabric, cotton tape, white velvet ribbon, white felt:
fabric stores

Hot melt glue:
craft and hardware stores

Cotton knit tubing (stockinette):
medical supply stores

Polyethylene pipe insulation, nylon electrical ties:
hardware stores

Unbuffered, acid-free (neutral pH) tissue paper:
conservation supply houses

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by the staff of the Textile Lab

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FLIPPER HANGERS

Designed to provide appropriate support for the neck, shoulders, and sleeves of garments without creating a dent in the shoulders where the hanger ends (fig. 4). The added foam creates sloping shoulders that add support for the sleeves while retaining enough flexibility to conform to the needs of the garment. They're particularly suited to 19th century shoulder profiles. These can be made from any size plastic hanger, the PMA uses 10", 12", 14" and 15" hangers.

DIRECTIONS

1. Wrap plastic hanger with polyester needlepunch felt. The felt should be cut to the appropriate rectangular size with a 3 ½" slit in the top center to accommodate the hanger hook. Place 3M double stick tape on the front, back, and interior ends of the plastic hanger and wrap felt around the hanger's form to create as smooth a surface as possible.

Fig. 1 Plastic hanger wrapped with felt

2. Cut 2" cotton stockinette to the appropriate length (34" for a 10" hanger, 36" for a 14" hanger), and clip a small hole into the center top. Pull the stockinette over the felt-wrapped hanger, with the hook pulled through the small hole in the stockinette.

Fig. 2 Foam, cut in half with both ends shaped

3. Cut a piece of cylindrical 1" diameter foam (10" for a 10" hanger, 12" for a 14" hanger), then cut the foam in half lengthwise. Round one end that will face the garment, and cut the opposite edge on a diagonal to fit into the shoulder of the hanger.

4. Insert the foam pieces under the stockinette and nestle the diagonally cut end into the shoulder of the hanger to create a smooth, continuous line. Cut the end of the stockinette in half and tie the two halves in a knot to secure the foam in place. The knot should face downward so it won't impact the garment.

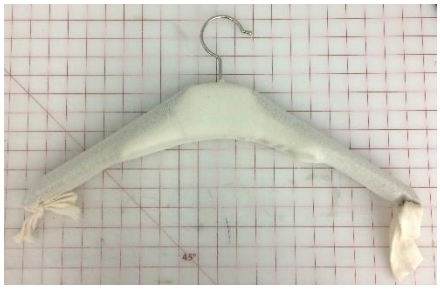


Fig. 3 Completed 10" flipper hanger

Fig. 4 Child's cape on regular padded hanger (left) and on a 10" flipper hanger (right).

FOSSHAPE® HIPS

Designed to safely hang skirts that cannot be hung with a flat clip hanger for long-term storage due to the volume or weight of the skirt or the slippery texture of the exterior fabric. Fosshape® has replaced the wheat starch and muslin hip forms that were previously constructed at the PMA, as these were extremely time-consuming and have been found to buckle over time. These three-dimensional mounts take up more space in storage but offer much greater support for skirts and allow the skirt and bodice of a dress to be stored together.

DIRECTIONS

1. Measure waist of skirt and choose a mannequin form of the appropriate size. Cut Fosshape® by tracing a corresponding template, or make a pattern that resembles figure 1 with the length equal to the widest section of the mannequin plus 2” and the height great enough to accommodate the waistband and offer support to the skirt, usually approximately 14” tall. Locations of the darts, if not working from a template, should be determined by loosely pinning the Fosshape® around the mannequin form.

Fig. 1 Pattern for Fosshape® hips

2. Machine-stitch the Fosshape® along the darts, with the marker lines on the inside of the form. Partially machine-stitch the center back seam of the Fosshape® with a long running stitch, starting from the bottom and leaving enough of the seam open at the top that the form will fit over the mannequin (fig. 2). Machine-stitched seams create stronger seams than hand-stitched seams when the Fosshape® is hardened. Darts also add strength to the overall form.


Fig. 2 Stich along dashed black lines, leaving an opening at the top center back so the form will fit over the mannequin

3. Turn the Fosshape® form right-side-out and place on the mannequin form. Hand-stitch the remaining section of the center back seam with a strong button thread in a contrasting color using a lacing stitch (fig. 3).

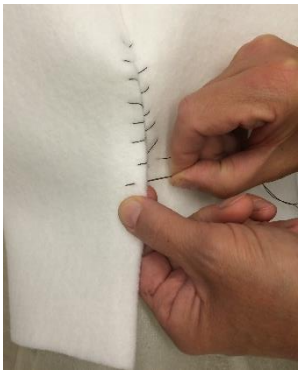


Fig. 3 Stitch back center

4. Steam the Fosshape® form, forcing it to harden and conform to the shape of the mannequin. Begin with the areas around the seams, gently applying steam to gradually shrink the Fosshape® overall. Working slowly and gradually retains the locations of the seams and darts and prevents the formation of creases or uneven areas. When the Fosshape® is approximately three-fourths uniformly hardened, apply the steam more aggressively by pressing the steamer against the Fosshape® covered mannequin to ensure that the Fosshape® becomes as ridged as possible (fig. 4).

5. Allow the Fosshape® form to cool before checking for areas that are not entirely ridged and require additional steaming. Areas that remain soft will feel different when touched and will be visible in raking light. Reapply steam to the Fosshape® as needed.

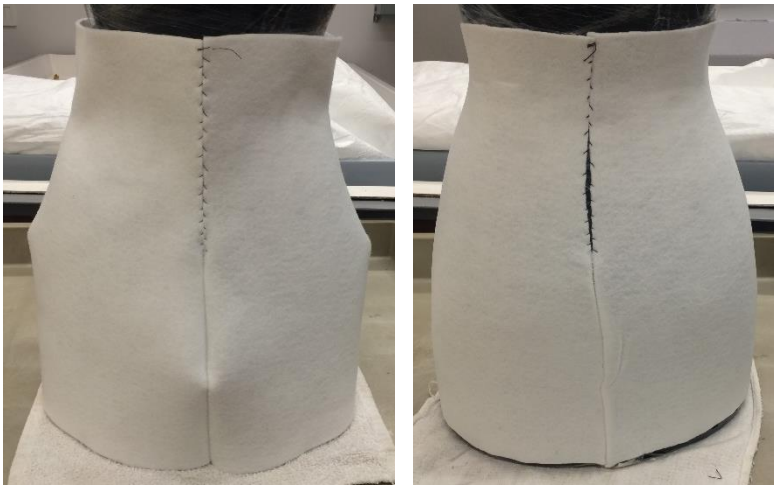


Fig. 4 Fosshape® form on the mannequin before (left) an after (right) steaming. Fosshape® will shrink by 15% or more, depending on heat application.

6. Use a seam ripper to open the center back seam to remove the form from the mannequin. Test the fit of the form in the skirt when the Fosshape® is dry to ensure that the finished hips will fit the intended garment, and make any necessary changes by trimming the Fosshape® with scissors or a utility knife.

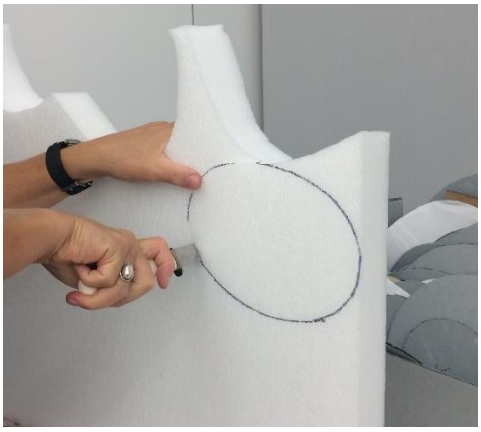


Fig. 5 Carve an Ethafoam® disk to fit the interior of the form

7. Create a 2” Ethafoam® disk for the interior waist of the Fosshape® form using a template of the appropriate size or by tracing the interior of the form. The disk should sit 1-2” below the top of the Fosshape®, where the skirt will rest on the hips, to provide extra structural support to the form. Trim the Ethafoam® to fit the interior of the form, using a knife to get the general shape and a rasp to carve and smooth the edges to the appropriate profile. When the disk is cut to the proper shape, mark its location on the interior of the Fosshape® form with a pencil.

Fig. 6 Glue the Ethafoam® to the interior of the Fosshape® form

8. Apply a large amount of heat-melt adhesive to the front and sides of the Ethafoam® disk and insert the disk into the Fosshape® form, aligning it with the pencil mark. Hold the Fosshape® around the Ethafoam® until the adhesive hardens, then open the Fosshape® form and apply heat-melt adhesive to the remainder of the sides and the back of the foam disk (fig. 6). Hold the Fosshape® in place on the Ethafoam® until the adhesive hardens. Add additional hot-melt adhesive to the bottom of the Ethafoam® disk through the bottom of the form as necessary.

9. The back center seam may be closed either by stitching or with hot-melt adhesive. To close with adhesive, cut a piece of

blueboard that is longer than the seam and approximately 1 ½" wide, with the flutes of the corrugation running the width of the strip. Crush the corrugation to impart flexibility to the blueboard strip so it will conform to the curve of the form, then insert it inside of the form between the Ethafoam® disk and the Fosshape® wall. Apply heat-melt adhesive to the blueboard strip and press it against the seam to hold both sides of the seam together (fig. 7).

10. Create loops from twill tape to hang the form from. Use a utility knife to cut slits at the top of the Fosshape® form, two in the back and two in the front, spaced approximately the distance of the neck of the hanger (fig .7). Thread the twill tape through a large upholstery needle, then insert the twill tape through all four slits with the ends at the back. Pull the twill tape up in the center of the form to form loops from which the form and skirt will hang.

11. Cover the form with 6" cotton or polyester stockinette. Polyester batting may be added under the stockinette as needed to pad out the form (fig. 8). Insert the form into the skirt and secure the skirt waistband closures, then loop the hanging loops around the hanger and tighten them so the top of the Fosshape® touches the bottom of the hanger. Tie the loose ends of the twill tape around the hook of the hanger to prevent the skirt and form from slipping off of the hanger.

Fig. 7 A strip of blueboard (black dashed line) is glued to the interior of the form to close the center back seam and twill tape is threaded through slits in the Fosshape® (red lines).

Fig. 8 Completed hips, covered in stockinette and attached to a hanger with the twill tape loops and ties.

Fig. 9 Skirt on the complete hips, the waistband is fastened with the hook-and-eye closures and the hip form provides extra support to the voluminous skirt.

Fig.10 Skirt hanging in storage, next to its associated bodice.

FOSSHAPE® BOCIDES

Full bodices may be created from Fosshape® to provide full support to a garment for long-term storage. The process of creating a bodice is similar to that of creating Fosshape® hips, but requires additional material. Abbreviated directions are provided below.

1. Measure the bust and waist of the garment to be supported with the bodice and choose a mannequin form of the appropriate size. Cut pieces of Fosshape® that resemble those shown in fig. 1 from a template, but do not cut the darts out until after they have been stitched.

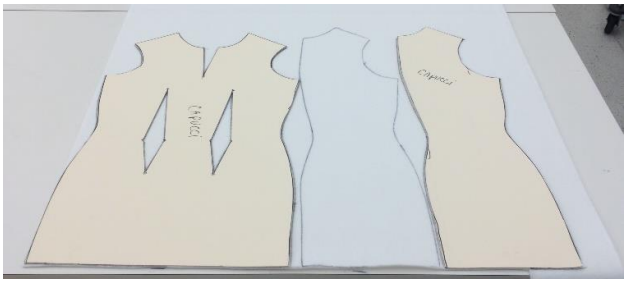


Fig. 1 Patterns for Fosshape® bodice

2. Machine-stitch the Fosshape® pieces together, leaving most of the center back seam open so the Fosshape® form will fit over the mannequin body. Stitch the darts together, then trim excess Fosshape® and place the form on the mannequin. Hand-stitch the center back seam closed.

3. Steam the Fosshape® on the mannequin form, following the same protocol as when making Fosshape® hips. Allow the form to cool and dry before cutting it off the mannequin and testing it in the garment to determine if any adjustments are required. Additional steaming of soft spots may be carried out after the Fosshape® has been cut from the mannequin, but this runs the risk of losing the desired shape of the Fosshape®.

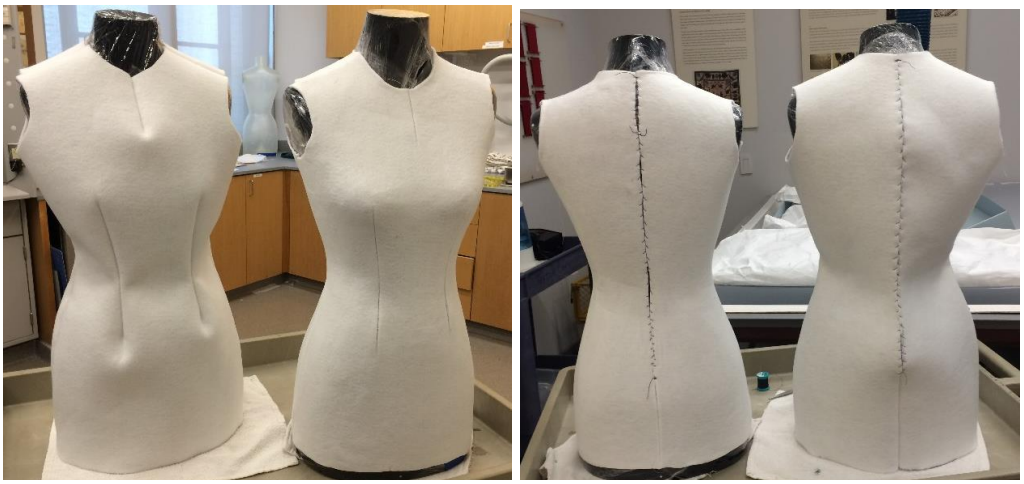


Fig. 2 Fosshape® bodice front and back, one form before steaming and the other after steaming

4. Create an Ethafoam® disk for the waist section of the bodice, and glue it into place with heat-melt adhesive. Stabilize the center back seam by gluing a blue-board spine in the interior of the form.

5. The bodice can be further modified to fit the needs of the garment, they are often cut just above the bust to accommodate strapless garments or those that do not require shoulder support. The Fosshape® bodice should be hung from its hanger through the addition of twill tape ties, following the same protocol as those for the Fosshape® hips. Cover the bodice with stockinette before inserting it into the garment to be hung.

CLIP HANGERS

Pants and some skirts are stored with clip hangers with a single piece of needlepunch polyester felt folded in half over the top of the garment to provide a padded barrier layer between the hanger and the garment. These clip hangers allow garments to be safely hung with a minimal footprint, but are not appropriate for garments that are made of smooth fabrics that can slip out of the hanger's grip over time or garments with significant weight or voluminous shapes. These kinds of garments are better suited for Fosshape® hip mounts.

DIRECTIONS

1. Cut a rectangle of polyester needlepunch felt that is wider and longer than the hanger (fig. 1).

2. Arrange the garment so the front and back waistband are aligned, paying careful attention to the way that the garment will fall when it's hung. Avoid the formation of folds in the garment where the hanger will grip, as folds will become creases and may cause tears during long-term storage.

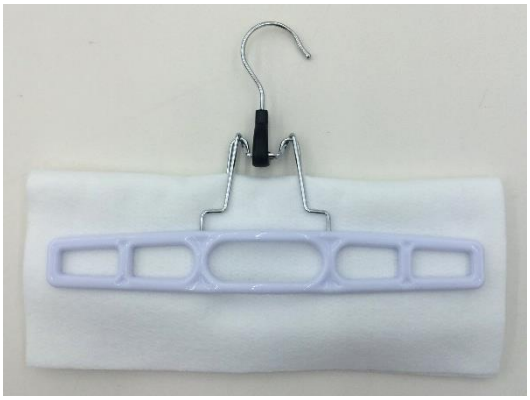


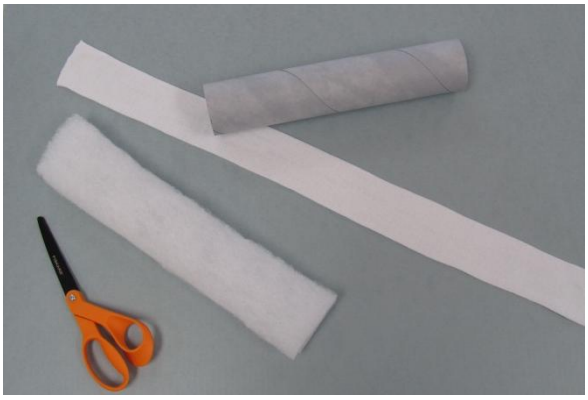
Fig. 1 Clip hanger with felt

3. Wrap the felt around the waistband, then place the hanger over the felt and clip it in place (fig. 2). Hang the garment and examine it to ensure that it is well supported before placing it in storage.

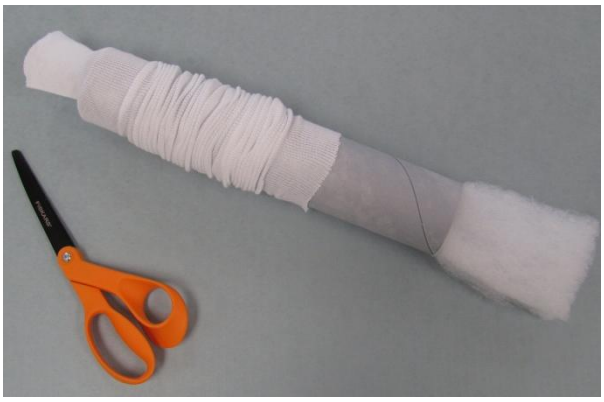
Fig. 2 Skirt hung on a clip hanger

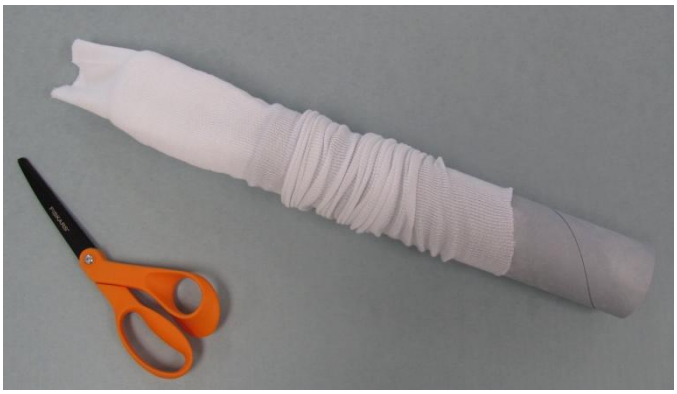
Making a Stockinette "Sausage"

When large textiles need to be folded for storage, it is important to pad out or cushion each fold in order to prevent creasing or eventual splitting of fibers. Although crunched acid-free tissue can be used, sometimes a softer more durable system is preferred. The following is a simple method of preparing "sausages" using Musetex batting and cotton or polyester stockinette.

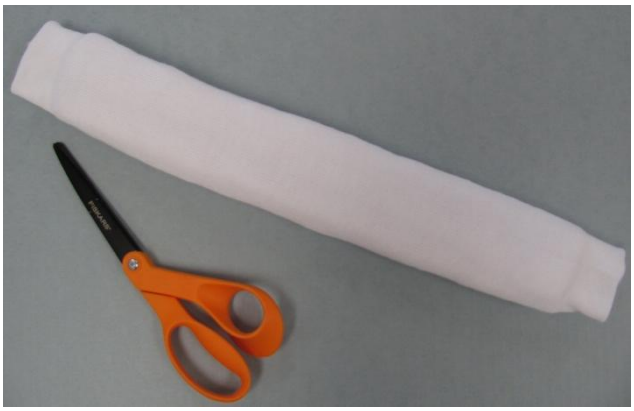


Scissors, batting, stockinette, small tube





The batting is inserted through the tube and the stockinette is threaded onto the outside of tube. Pinching the batting and stockinette at one end, pull gently a few inches at a time. Always cut the stockinette longer than the final necessary length. Its length shrinks as it expands in width, and you'll want a little extra on each end.



Tuck in the raw edges of the stockinette at each end.

A Custom-made Mount for Display, Storage and Transportation of a Fragile Hat

Jan Vuori

Application:

This type of custom-made mount is suitable for fragile hats which should not be handled directly and which require complete internal support over the long term. The mount was made for a felt cocked hat from the collections of the Niagara Historical Society & Museum, Niagara-on-the-Lake, Ontario (**Fig. 1**). The hat was made in England for Major General Sir Isaac Brock who was killed in the battle of Queenston Heights on October 13, 1812.

The original shape of the hat was quite well preserved, however, over time the felt had become very stiff and brittle and there were numerous cracks and losses along the fold of the brim. Although these weak areas were repaired to prevent further loss, they were subject to more damage whenever the hat was handled. A mount which completely supported the brim was required. The mount also had to be suitable for display, transportation and storage in order to eliminate the need to handle the hat. The moderate cost of materials and the amount of labour involved are offset by the multi-purpose function of the mount.

Description:

The crown portion of the mount was made out of a dome-shaped piece of polyethylene foam (Ethafoam), and the portion of the mount supporting the fragile brim was made out of plaster bandages, reinforced with coat hanger wire. The plaster was sealed with acrylic latex paint and the entire assembly was lightly padded with polyester quilt batting covered with cotton/polyester knit fabric. A pressure sensitive adhesive was used to attach the knit fabric to the concave underside of the mount.

The stand was made out of acrylic rod attached to an oval-shaped acrylic base. For transportation and storage, a drop-front box was made out of corrugated plastic board, plastic rivets and fabric tape. Polyethylene foam spacers help to immobilize the mounted hat within the box.

Supplies, Special Skills:

- Plastic food wrap, stretchy type (e.g., Saran Wrap)
- Plaster bandages (e.g., Gypsona)
- Metal coat hanger
- Acrylic latex paint, white
- Polyester quilt batting, heat-fused
- Knit fabric, prewashed, colourfast
- Pressure-sensitive adhesive, archival quality (eg., Lascaux 360 HV)
- Acrylic sheet, 1/2-inch, and acrylic rod, 3/4-inch (e.g., Plexiglas)
- Methylene chloride
- Chrome metal polish or Plexiglas polish
- Polyethylene foam, 4-inch thick (e.g., Ethafoam)
- Corrugated plastic sheet (e.g., Coroplast)
- Hot-melt glue
- Cotton thread, white
- Cotton fabric tape
- Plastic rivets, 1/2-inch (e.g., Adjust-A-Lok)
- Jigsaw with fine tipped blade, suitable for cutting acrylic sheet
- Drill press with Forstner bit, for drilling acrylic sheet

Fabrication of the acrylic stand required the use of a jigsaw equipped with a blade suitable for cutting acrylic sheet, and a drill press equipped with a Forstner bit for drilling a recess in the acrylic sheet. The exposed edges of the acrylic were finished, and the stand was assembled as described below. If the tools or skills required for working acrylic sheet are not available in-house, this work can be done by plastic fabricators.

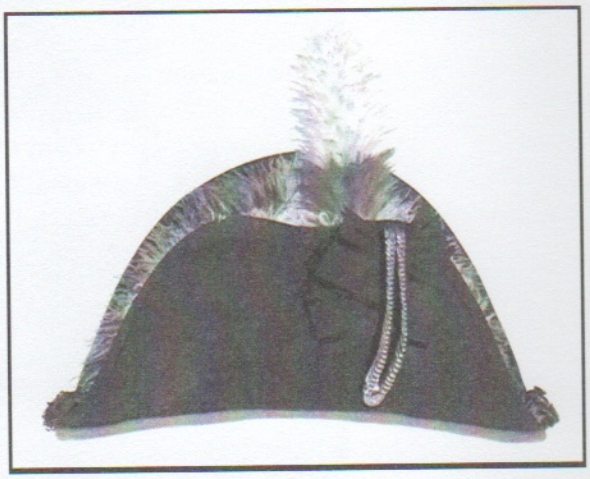


Fig. 1 *Fragile felt hat on mount.*

Construction Method:

1. The felt hat was supported in a custom-made device which enabled it to be inverted without crushing the ostrich feathers. Hats without feathers or other three-dimensional decoration may be inverted in a supporting bed of knit covered polyester quilt batting or polystyrene beads. Using measurements of the rounded crown, a dome-shaped piece of polyethylene foam was carved and placed inside the crown of the hat.

2. The interior of the hat was then isolated with stretchy plastic food wrap which conformed exactly to the shape of the hat. The exterior of the hat was also covered with plastic food wrap to protect it from accidental spills.

3. Strips of plaster-coated bandages, approximately 3 to 4-inches long, were wetted and applied to the interior of the hat. The strips moulded to the contours of the hat. Two layers of bandage strips were applied and allowed to dry **(Fig. 2)**.

Fig. 2 *Applying plaster bandages.*

4. Two lengths of wire taken from coat hangers were bent to fit onto the bottom surface running in the long direction. The purpose of the wire was to reinforce the two relatively long, thin ends of the mount. Additional strips of plaster bandages were used to embed the wire into the mount.

5. The plastered mould was removed from the hat and allowed to dry. Rough edges were trimmed with a knife, and the entire surface was sealed with two coats of white acrylic latex paint.

6. The polyethylene foam dome was positioned on the mould following indications in the plaster, and was adhered in place with hot glue.

7. The entire assembly was covered with polyester quilt batting and then with prewashed cotton/polyester knit fabric stitched in place. A pressure-sensitive adhesive (Lascaux 360 HV) was used to attach the knit fabric to the concave underside of the mount.

8. The stand for the mount was made by cutting an oval out of 1/2-inch acrylic sheet (Plexiglas) using a jigsaw. The cut edge was buffed smooth using 220 and 240 grit sandpaper, and polished crystal clear using chrome metal polish. The protective paper was then removed from the acrylic sheet.

9. A recess, 3/4-inch in diameter, was drilled to a depth of 1/4-inch in the centre of the acrylic base using a drill press equipped with a Forstner bit. A length of acrylic rod was inserted into the recess, and was fixed in place by applying a few drops of methylene chloride to the join. The methylene chloride wicks into the join and causes the acrylic surfaces to weld together. The opposite end was inserted through the knit fabric into a channel bored into the plaster/polyethylene foam **(Fig. 3)**.

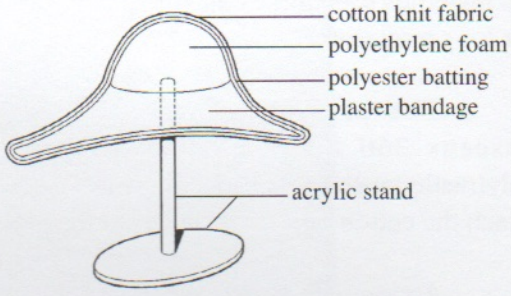


Fig. 3 *Layered structure of the mount.*

10. The mount is moulded to the exact shape of the hat which is not symmetrical. Therefore, it is important to place the hat on the mount correctly. To facilitate returning the hat to the mount (should it ever be removed), the front was labeled with white cotton embroidery thread.

11. For transportation and storage, a drop-front box was made out of corrugated plastic sheet (Coroplast), plastic rivets (Adjust-A-Lok), and cotton fabric tape using methods described in CCI Technical Bulletin 14 *Working with Polyethylene Foam and Fluted Plastic Sheet*. The hat stand is immobilized within the box by sliding it into a semicircular-shaped recess carved into a four-inch thick piece of polyethylene foam. Another piece of polyethylene foam with a corresponding semicircular-shaped recess is then slid into the box (front photo). Nothing beyond gravity holds the hat onto the mount, therefore the box must never be turned upside down during transportation. The accession number and the proper orientation are clearly marked on all sides of the box.

Adaptations, Cautions, Recommendations:

This type of custom-made mount takes a fair amount of time to make. Once made, however, it completely supports the hat, particularly the fragile brim. The mount can be used for display, transportation and storage, thereby eliminating the need for direct handling of the artifact. According to the curator: "It's great, I never have to touch the hat at all. I simply hold the stand to move the hat into the display case or back into its storage box". Since the artifact will remain on the mount over the long term, it is imperative that the materials used in its construction be suitable for long term use.

The pressure-sensitive adhesive Lascaux 360 HV, a poly(butyl acrylate) poly(methylmethacrylate) copolymer, was used to attach the cotton knit fabric cover to the mount.

Appropriate health and safety measures must be taken when working with methylene chloride. Check the Material Safety Data Sheet (MSDS).

Acknowledgements:

Carl Schlichting (then CCI Objects Conservator) made the device used to invert the hat; Bob McRae, CCI Preparator, made the Plexiglas stand; Jeremy Powell and Carl Bigras, CCI Photographers, took the photographs.

Bibliography:

Barclay, R., A. Bergeron, and C. Dignard. *Mount-making for Museum Objects*. Ottawa: Canadian Conservation Institute, 1998.

Schlichting, Carl. *Working with Polyethylene Foam and Fluted Plastic Sheet*. Technical Bulletin 14. Ottawa: Canadian Conservation Institute, 1994.

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Hat Mount with Brim Support

Julie Randolph and Jane Merritt

Application:

This type of hat mount is best used for storage and study purposes as it is functional and allows visual access to the piece without handling the actual object. It can be easily and inexpensively made, and therefore is good for mounting a moderate to large collection. The overall support of the mount allows some weaker or incomplete headgear to be shown in a way similar to that in which it would have originally appeared. The hat does need to have a moderately flat bottom profile for proper support and be lightweight and in good condition. Crushed, misshapen, and seriously damaged hats, or hats with fragile interiors, should not be reshaped and mounted without the aid of a conservator.

This mount was developed for Gettysburg National Military Park's study collection of military and civilian headgear, and was designed and executed at the textile conservation lab at Harpers Ferry Center, National Park Service.

Description:

This mount is made of three components: a crown/brim support, a carrying support base, and a pedestal connecting the two. The crown support is polyethylene foam padded with polyester needlepunch batting and covered with a smooth cotton fabric. The brim support is an acrylic deck cut to shape and smoothed on the edges. The stand is a foam pedestal attached to a sturdy cardboard base. The base may have twill tape attached for ease in lifting out of a drawer or box. The headgear is not attached to the mount other than by friction and gravity.

Supplies, Special Skills:

- Polyethylene foam, 2.2 lbs/ft ^{3}, white, 2-inch thick
- Needlepunch polyester batting. 1-inch thick batting can be separated into thinner sheets
- Polyester felt
- Acrylic sheets, clear, $^1/_8$-inch thick
- Non-acidic cardboard, 4-ply or greater, archival quality (e.g., corrugated blueboard)
- Plain weave cotton, undyed, prewashed (e.g., batiste or other cotton with similar tooth)
- Hot-melt adhesive (ethylene vinyl acetate)
- Twill tape, prewashed
- Knives, for cutting Ethafoam

A band saw was used for the initial cutting of the polyethylene foam and for cutting the acrylic sheets. The foam was further shaped with a foam knife. The edges of the cut acrylic were sanded and polished to remove any rough edges which could catch the object. The hot-melt adhesive was applied by glue gun. The cardboard base was cut with a mat knife. To create a cylindrical pedestal, solid polyethylene foam tubes can be ordered in diameters ranging from one to six inches.

Construction Method:

Crown support

1. A good eye is necessary to create the basic support shape and avoid numerous fittings and re-cuttings. Measure width and length of the inside of the brim and subtract ½ inch from each dimension. Transfer these measurements and the approximate inside shape to a sheet of foam and cut a disc shape. If the inner height of the crown is less than 1½ inch, or tapers severely at less than 1½ inch height, reduce overall height or taper selected areas to within a ¼ inch of desired height. If the height is greater than about 3 inches, a second disc of foam can be cut to fit the upper part of the crown, again with a ½ inch allowance on each side and an allowance on top.

2. Using a foam knife, shape the foam to fit the inside of the hat, and round all foam edges which will be inside the headpiece (**Fig. 1**). Remember that the needlepunch batting may be used for excess padding, so it is better to undersize the foam and reduce strain on the hat. If the headpiece is an awkward shape, the foam may be covered with a piece of the batiste and placed inside the hat to ascertain where shaping and padding need to take place. If more than one disc of foam is necessary, the two discs should be glued together with the hot-melt adhesive.

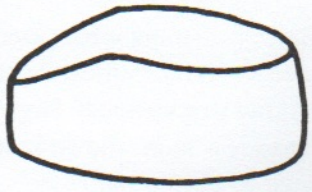

Fig. 1 *Polyethylene foam block carved to shape, edges rounded.*

3. Decide where extra padding will be necessary and cut out desired shapes in the needlepunch batting. Attach to foam support with hot-melt adhesive (**Fig. 2**).

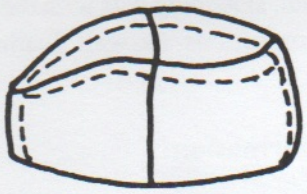

Fig. 2 *Mount padded out with needlepunch polyester batting to fit dimensions of the hat.*

4. Cut a piece of polyester felt large enough to fit around entire top of the support. Cut darts around the sides so that the felt will lie smoothly on the form. Place a line of adhesive around the sides of the support at the bottom edge. Attach the felt snugly but not stretched too tightly, covering the entire top of the form. Cover the support again with the batiste and place inside the hat to make sure that it supports, but does not strain, all parts of the hat's interior.

5. Cut a piece of washed cotton batiste large enough to fit around the entire top of the support, and go under about a 1/2-inch on the bottom. Cut darts as necessary so that the batiste will lie smoothly on the form. Place a line of adhesive about a 1/2-inch inside the edges of the bottom of the support (i.e., the underside of the bottom Ethafoam disc), and attach the edges of the batiste **(Fig. 3)**. This avoids having less than two barrier layers between the adhesive and the artifact.

Fig. 3 *Padded mount is covered with cotton batiste to smooth out profile and protect the hat's interior.*

Brim Support

6. Trace the outer dimension of the hat brim onto a piece of clear acrylic, and cut the acrylic large enough to support all areas of the brim. Sand and polish the cut edges to remove any roughness.

7. Place the hat on the mount and position the hat on the acrylic deck so that the brim is fully supported. Mark the position and remove the object. Glue the mount to the deck, making sure that no adhesive seeps out the side.

Storage/handling support

8. Cut a piece of sturdy cardboard into a rectangle allowing at least three inches on each side of the headpiece. If pre-existing boxes, drawers, or shelves are to be used for storage, the cardboard bases may be cut to a uniform size for easier placement. If the hat is stored in a box or drawer, cut slots in the board near the sides and thread with twill tape for ease of lifting the entire piece out without having to handle the actual object.

9. Cut a pedestal column 2 1/2 to 3 inches in height (height may vary according to weight and balance of object) and place the hat support, with hat, on the column. Decide which position of the support gives the best stability for the mount and mark it (again, making sure that the hat has three inches or more clearance on each side). After the hat is removed, the acrylic deck is glued to the column, and the column to the cardboard base **(Fig. 4)**. When the adhesive has dried (we allowed several hours), the hat may be put back on. Hot-melt adhesive (ethylene vinyl acetate) is safe for supports but not for contact with objects.

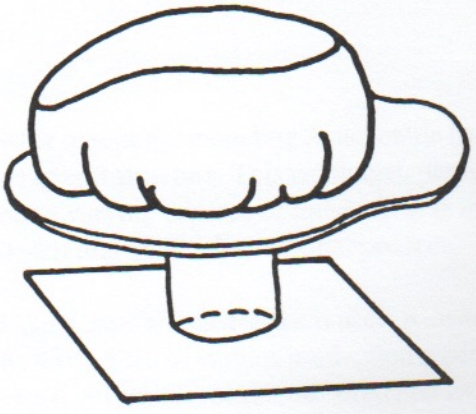

Fig. 4 *Acrylic brim support, foam pedestal, and cardboard base.*

Adaptations, Cautions, Recommendations:

This mount works best for objects with flat bottom profiles, but may be adapted for strong, lightweight headgear such as cloth bonnets by turning the foam sheet sideways and carving the form, and omitting the acrylic deck. The only restriction is that a flat area large enough for the pedestal remains and the piece is not too top heavy.

The pedestal can be made from a cylinder of extruded polyethylene foam; alternatively, slabs of foam can be cut to the desired shape, 2½ to 3-inches high.

The main concern is that the object is fully supported without placing any stress or strain on it. Sometimes inner linings are much smaller than the hat itself, and this can lead to slouching. On the other hand, slouching hats with the same inner and outer proportions are well displayed using this method.

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