

Conservation Book Repair: A Training Manual

by
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IV. SIMPLE BOOK REPAIRS

Most book repairs begin as simple problems. If a simple problem is ignored or handled incorrectly, it becomes a complex repair. When a book is repaired early, there is much less work and the volume stays in circulation longer.

A. CLEANING PAGES

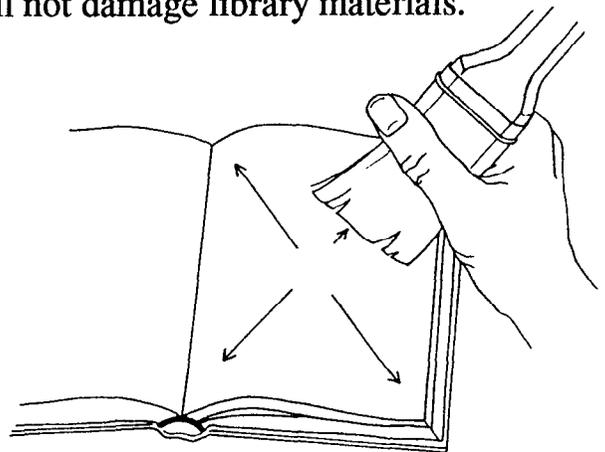
When attempting to clean paper, always start with the least abrasive cleaning method before trying others.

Keep in mind that cleaning library materials be a time consuming task. Evaluate each book before attempting to dry clean it. Make sure that cleaning a particular volume is a good use of time.

1. Dry Cleaning

Dry cleaning is any kind of cleaning that does not use water or liquid cleaners. Done correctly, dry cleaning will not damage library materials.

Some dirt can be swept off the page using a soft, natural bristle brush. Always brush from the center of the page out toward the edges in a star burst pattern and up and down the hinge area to remove dirt or eraser crumbs.



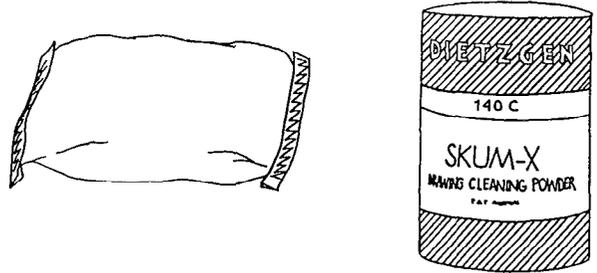
Brushes can be of any size but should have soft, natural bristles. Plastic or nylon bristles can scratch the paper. Brushes used for dry cleaning should not be used for water, paste or glue so it's best to designate a brush just for dry cleaning.

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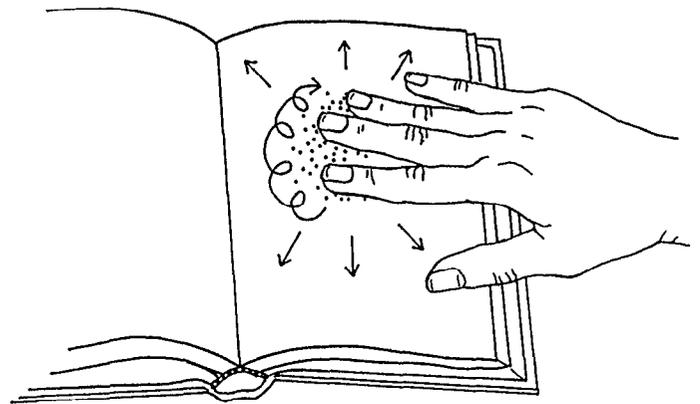
Watch out for paper tears that can catch on the brush and **NEVER** brush from the edge of the paper toward the middle. The brush could "grab" the edge of the page, pull it back on itself and cause a tear. This is especially important to remember when there are small tears on the edge of the page.

After using a dry brush to sweep off the surface dirt, products such as Opaline or Skum-X can be used to remove more stubborn surface dirt.

Opaline and Skum-X are both eraser products. Opaline comes in a bag and Skum-X in a shaker dispenser. Opaline is applied by kneading the bag above the paper until the paper is covered with a fine powder of tiny eraser crumbs. Skum-X is applied like salt from a salt shaker.



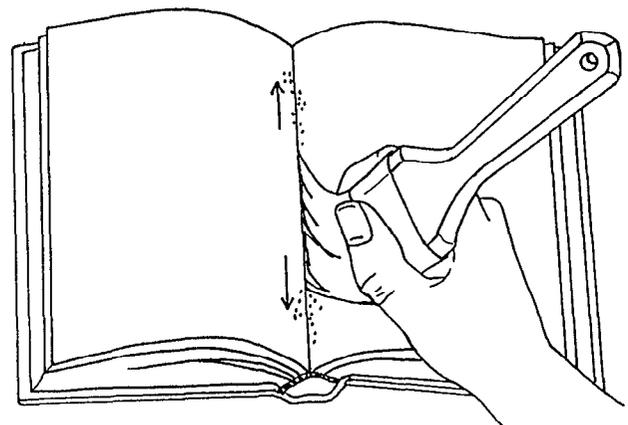
Using clean fingers, rub the paper lightly in a circular pattern. **DO NOT RUB THE PAPER WITH THE OPALINE CLOTH BAG** or the bag will become soiled quickly and transfer that dirt onto the page. It is possible to protect the page from skin oil by rubbing through a soft cloth or a piece of polyester film, such as Mylar.



ALWAYS work in a circular motion from the center of the page toward the outside edge. Be very careful of the edges of the page; they tear easily.

The eraser crumbs change color as they pick up dirt. Once they seem to have picked up as much dirt as possible, brush the eraser crumbs off the page.

Use a natural bristle brush to sweep the eraser crumbs off the page. Brush from the center of the page toward the edge of the paper and don't forget to sweep the eraser crumbs out of the hinge area. If the page is



still dirty, repeat the procedure. When the eraser crumbs do not change color, they have picked up as much dirt as possible.

Librarians often find pencil or pen notations on the page of a book. While most pens are permanent, some pencil marks can be erased from paper. A white vinyl eraser, such as Faber Castell brand Magic-Rub eraser, is recommended because it is less abrasive than most other erasers. These vinyl erasers come in several sizes and can be shaped with a knife or purchased in a pencil form and sharpened to reach small areas or between lines of print.

Erase in one direction, working from the center of the paper toward the edges of the paper. **DO NOT** rub the eraser back and forth or erase from the edge of the paper toward the center of the book.

Use a natural bristle brush to sweep away the eraser crumbs, paying special attention to removing eraser crumbs from the inner margin of the page. Remember to brush from the center of the page toward the edge.

2. Other Types of Cleaning

Dry cleaning will only remove surface dirt. More advanced cleaning techniques include taking the book apart and washing each page. That is a time consuming and costly process. If simple dry cleaning does not seem to be successful, it may not be feasible to clean the book. If the book is still usable as is, return it to the shelf. If it is not usable, consider replacing the book. Keep in mind that staff time is valuable and many books need attention. Consider educating patrons with a "Keep Our Books Clean" campaign.

B. TIGHTENING OR REPAIRING CASE BINDING HINGES

Case binding is a general term for the process of constructing a hard cover book in two parts: the text block and the case or cover.

As detailed in *BOOK CASE CONSTRUCTION*, the major point of attachment between the text block and the cover is the crash cloth that covers the spine of the text block and is glued to the cover boards. The text block is usually attached to the case so that it sits approximately 1/8 - 3/16 above the shelf. This means that gravity is constantly pulling the text block down.

The adhesive in the hinge area can dry up over time and become weak while the spine and endpapers are still intact. When the glue dries up, the crash separates from the book board and the hinge area becomes loose. Often the end paper will split along the hinge and the crash will be visible underneath.

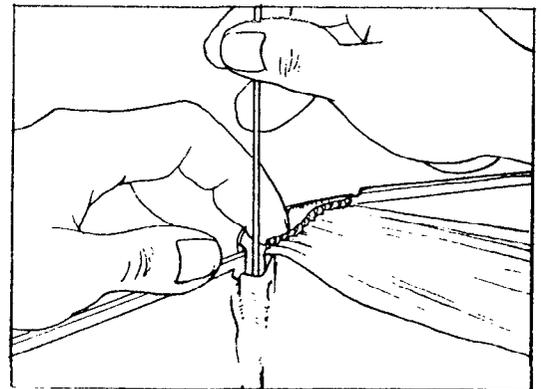
The common repair practice of applying plastic tape to the hinge area does nothing to reattach the crash to the case board, it only adds a layer of tape in the book.

1. TIGHTENING LOOSE HINGES

NOTE: If a book needs other repairs such as recasing or rebacking, do not tighten the hinges until those repairs are completed. Tightening hinges is generally the last repair to be completed.

When the hinge area is loose and the endpaper is not torn, use a wooden stick such as a bamboo skewer or thin knitting needle coated with PVA to feed a small amount of PVA into the joint area.

Carefully insert the PVA-coated knitting needle or stick into the hinge area at the top of the book, rotating as the stick is pushed down.

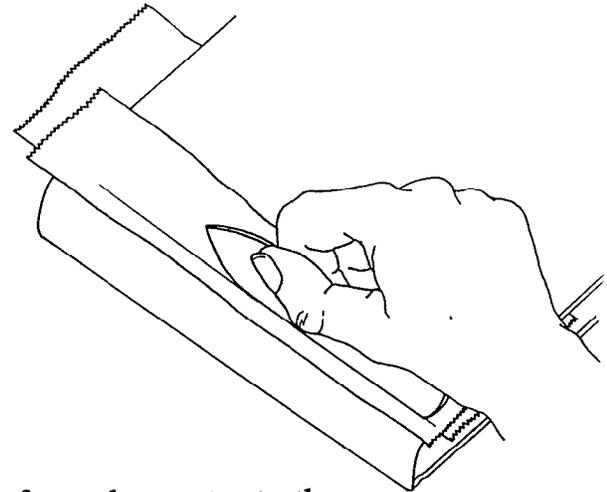


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Pull the stick out, turn the book over and repeat on the opposite end. Be careful not to get any glue on the spine of the text block.

After both ends of the hinge are glued, put a piece of wax paper or non-stick material in the hinge area to protect the end paper from any excess glue that might seep through the torn hinge area or out the head or tail. Remember, glue in the wrong place could glue the book shut!

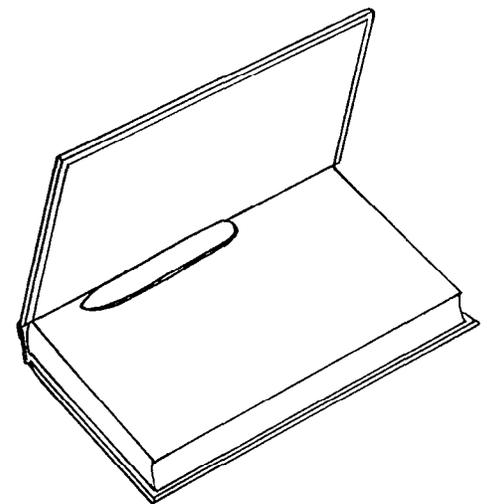
Close the book and use the long thin edge of a folder on the outside of the cover to work the book cloth down into the case joint. Use the long edge of the folder as the ends, even the rounded one, can sometimes tear through the book cloth.



Work from the center to the top of the book, then from the center to the bottom of the book. This will adhere the crash, end paper and book board and move any excess glue out of the hinge area.

Note: Rubbing the folder along the spine joint can make the book cloth shiny. To prevent this, lay a piece of non-stick material or thin paper on the book cloth before working with the folder.

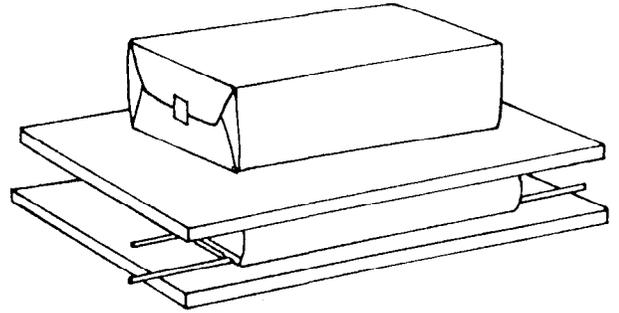
Open the book cover and use a folder to gently work the end paper back into the hinge. Again, use the long flat edge of the folder as the ends can tear through the paper.



Replace the wax paper in the hinge, close the book and rub the folder in the outer joint once again.

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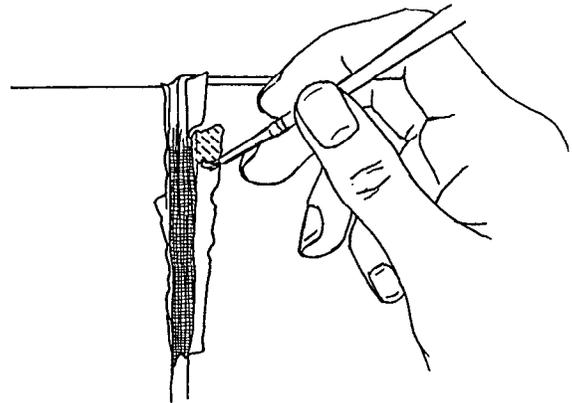
Place the book in a book press to dry. If a book press is not available, put knitting needles or shelf list drawer rods in the hinge areas of the case and place weight on the book. Let dry overnight and return to the shelf.



TIGHTENING/REPAIRING DAMAGED HINGES ON A CASE BINDINGS

A variation of the TIGHTENING LOOSE HINGES technique can be used when an endpaper is split at the hinge. Check the crash carefully, if more than 1/4 of the crash is torn, it should be replaced. (Replacing crash is discussed in RECASING, page 99).

Use a small paint brush or microspatula to apply glue to the split endpapers and work them into position.



Put a piece of wax paper or non-stick material in the hinge area to protect the paper from any excess glue and close the book.

Use the long thin edge of a folder on the outside of the cover to work the book cloth down into the case joint. Remember the rounded ends of the folder can sometimes tear through the book cloth.

Work from the center to the top of the book, then from the center to the bottom of the book. This will adhere the crash, end paper and book board and move any excess glue out of the hinge area. Wipe away any excess glue and try to use less glue in the future.

After setting the joint with the folder, carefully open the book cover and gently work the folder along the inside hinge, working the end paper back into the hinge. Again, use the long flat edge of the folder as the ends can tear through the paper.

Replace the wax paper. Place the book in a book press or put knitting needles or shelf list drawer rods in the hinges and weight with paper covered bricks. Let dry for at least one hour, then check the repair.

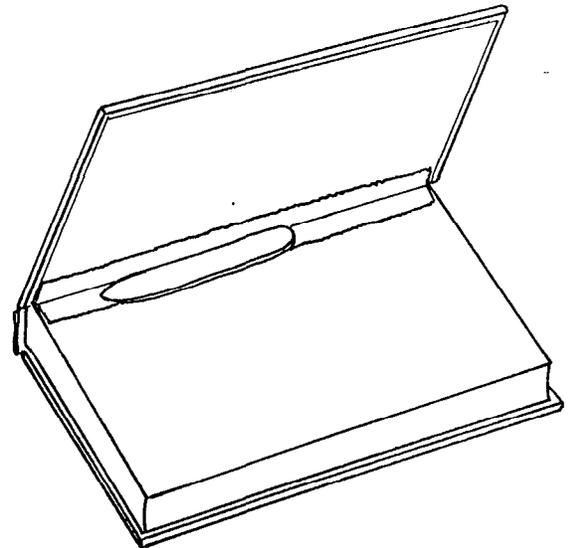
Sometimes the repaired end papers will not quite meet. This space will not affect the strength of the repair but it can be covered with a strip of Japanese tissue and wheat paste for a cosmetic touch.

Tear a piece of Japanese tissue (page 33) the height of the text block and wide enough to cover the hinge repair. Apply paste to the Japanese tissue (page 34) and gently lay the tissue on the hinge.

Use a folder to carefully work the tissue back into the hinge.

Insert a piece of wax paper or non-stick material, close the book and use the long edge of the folder to work the cloth into the cover joint.

Place the repaired book in a press or insert rods or knitting needles in the joints, add weight, and dry overnight before returning it to the shelf.



C. MENDING BOOK CASE CORNERS

The corners of a book take a great deal of stress and can be damaged while the rest of the case is still in good condition.

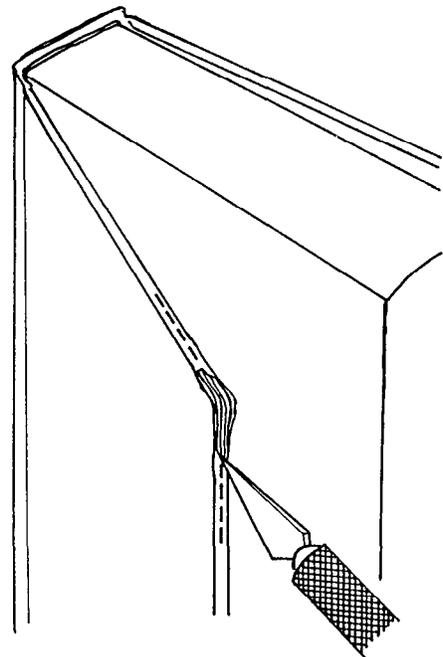
This is another repair that is often handled with plastic tape or purchased "repair wings." Applying tape or wings does not repair the corner; instead it adds a layer of tape on top of the problem. The adhesive on the tape can seep out or dry up over time, causing the plastic carrier to fall off. That can leave behind a sticky residue that is often impossible to clean up.

NOTE: If the book cloth has been worn off the top or bottom edges of the cover boards, replacing the book cloth at the corners may not be a wise use of time. Consider rebinding the book.

1. REPAIRING BOOK BOARDS CORNERS

The book board used in book case construction consists of many layers of board. If the book cloth is damaged or torn open at a corner, the different layers of board are often visible. When damaged corners are repaired with plastic tape, the book board is not repaired, it is only covered up. To truly repair the book corner, the various layers of book board must be glued to one another and the book cloth repaired or replaced.

In some cases the corners are damaged while the book cloth is still intact. Other times the book cloth will be torn or missing. In either case, cut through the book cloth on the top and fore edge of the board. Cut well past the damaged board into sound board and cloth.



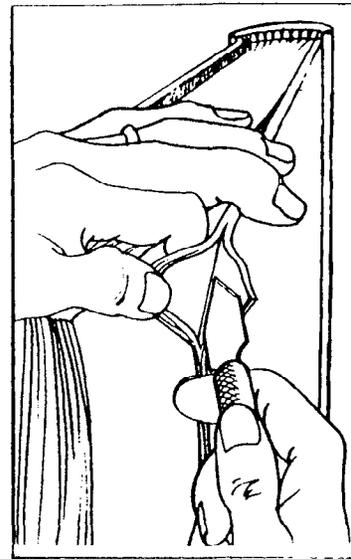
Separate the layers of board and use a microspatula or knife to apply PVA glue to several of the book board layers. The PVA will seep through the thin layers of board so every layer does not need to be glued. The number of glued layers depends on the condition of the book board.

If the original book cloth covers the corner, paint a small amount of glue on the wrong side of the book cloth and smooth it over the corner. If the book cloth needs to be replaced, follow the instructions for **Attaching New Corner Book Cloth**, page 48.

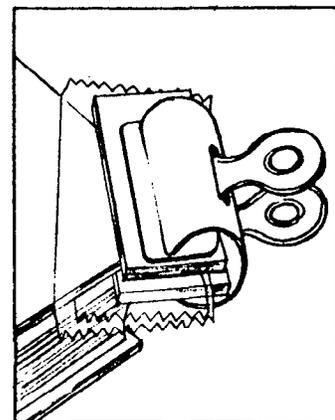
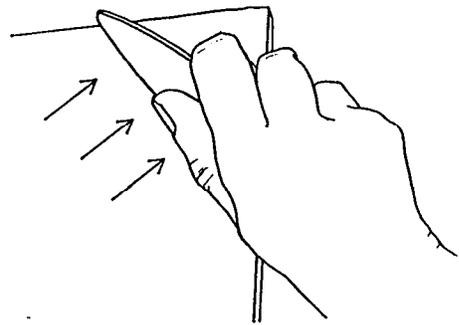
With fingers or a folder, press the book cloth onto the board, moving from the base of the repair up toward the corner edge. Wipe away any excess glue with a cloth or paper towel.

Note how much excess glue came out of the corner and use that as a gauge to decrease or increase the amount of glue used. A **small** amount seeping out is good because it means that the glue has reached all the layers of cardboard. Too much adhesive seeping out is wasteful and makes a mess to clean up.

For sharp flat corners, cover each side of the corner with wax paper or non-stick material and clamp between two pieces of book board using Binders or Bulldog clips (available in most office supply stores or catalogs). Use dense mat board or book board, not corrugated cardboard that will compress under the pressure of the clips.



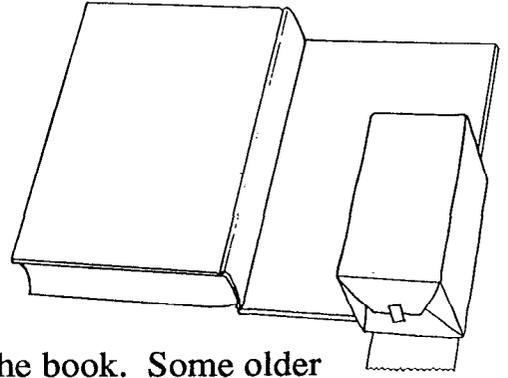
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Another way to achieve flat corners is to lay the repaired corner flat against the work table and weight it down with a paper covered brick.

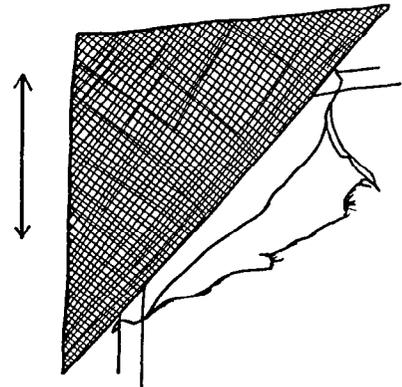


Corners do not have to be sharp or flat to protect the book. Some older books may look more "natural" with rounded corners, especially when only one or two corners are repaired. If rounded corners would look better, mold the corners into position while the glue is wet and let the repair dry without weight or pressure.

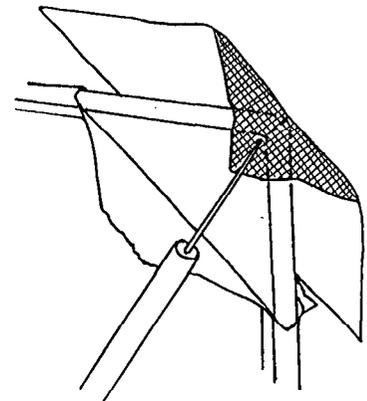
2. ATTACHING NEW CORNER BOOK CLOTH TO A REPAIRED CORNER

After the corner book board is repaired, cut a piece of new book cloth to cover the repair. The grain of the book cloth (page 14) must run parallel with the spine of the book.

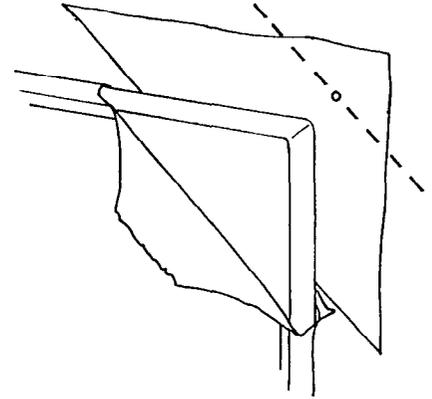
Glue the book cloth patch in place on the outside of the book cover. Dry under weight.



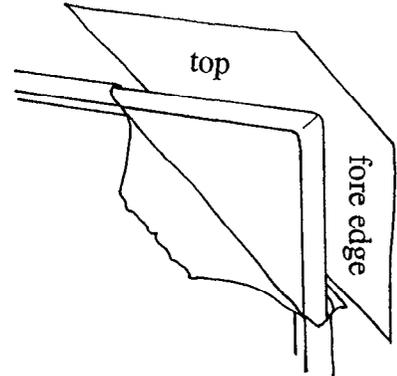
Fold the point of the new book cloth corner over the book board so it forms a 45 degree angle. Use a needle-in-a-stick to mark the position where the book cloth covers the corner. This mark should be as close to the edge of the corner as possible



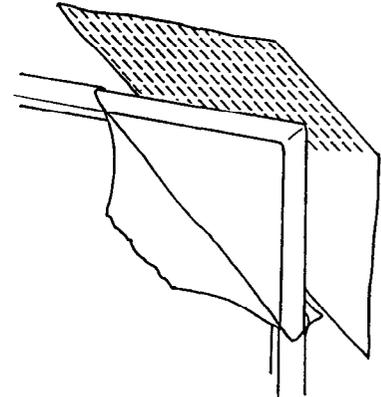
Unfold the new book cloth corner and draw a line through the needle point, along the 45 degree fold. Cut the book cloth along this line.



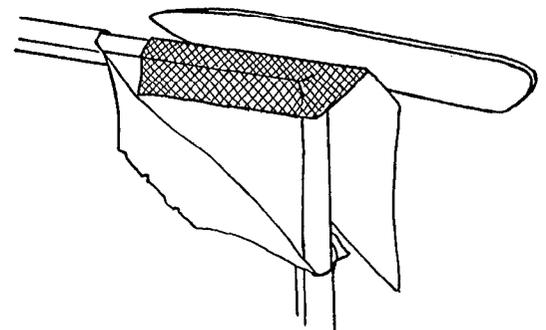
The new book cloth patch has two edges. Regardless of which corner is being repaired, the top or bottom edge of the book will be designated as the top. The other edge will be the fore edge of new book cloth patch.



Apply PVA along the top edge of the new book cloth then fold the edge over the book board.

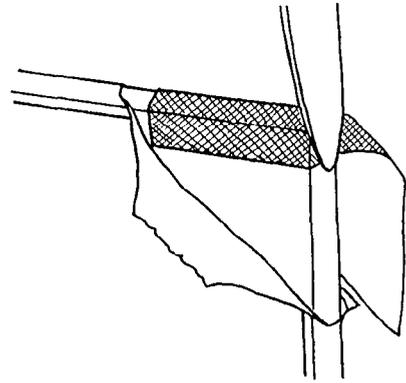


Use a folder to press the book cloth flush against the thickness of the book board. The book cloth should be glued completely flat to all sides of the book board.

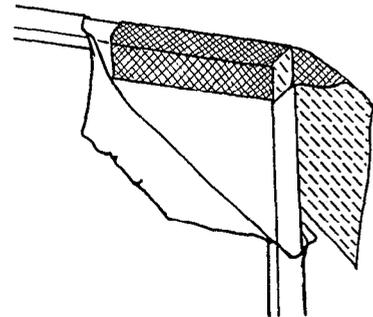


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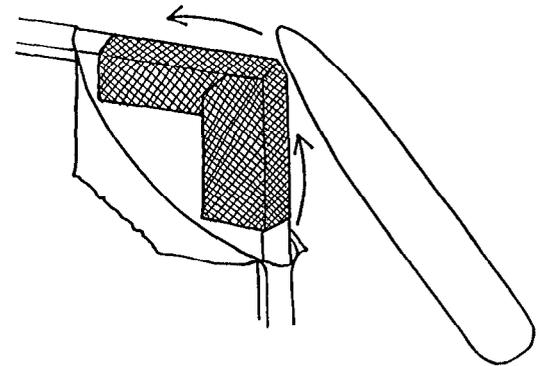
The new book cloth has a tendency to bulge out at the corner so push the new book cloth downward against the front edge of the book board with the point of a folder.



Apply glue to the fore edge of the new book cloth and work the cloth into position over the book board with a folder.



Use a folder to work the new book cloth flat against the book board and slightly round the corner.



The original cloth can be trimmed to eliminate the ragged edges and glued down or the ragged edge can be glued as is. Gluing the loose threads down can sometimes help camouflage the new book cloth if it is not a good color match.

Dry the repair under weight using paper covered bricks (page 48) or between pieces of book board with Bulldog clips (page 47).

Some older books may look more "natural" with rounded corners, especially if only one corner is being repaired. For rounded corners, mold the corners into position while the glue is wet; dry without weight or pressure.

D. PAPER TEARS, CUTS AND LOSSES

Illustrations in this section show each repair completed in a bound book. The same techniques are used for a single sheet of paper not bound in a book.

Paper tears are a simple repair often handled incorrectly with clear plastic tape. Clear plastic tape covers up the problem but it does not repair it and it can cause additional damage to the paper over time. As discussed in **CLEAR PLASTIC TAPE** on page 18, plastic tape should only be used on materials that are not considered a part of a permanent collection.

1. REPAIRING SIMPLE OR COMPLEX TEAR

Paper tends to tear at an angle so most tears will have a top and a bottom. If the tear passes through the text or an illustration, it is easy to see which is the top or bottom because the bottom of the tear will show the white paper fibers. If the tear does not pass through text, look at the tear very carefully before pasting it together.

Some tears will go with the grain of the paper while others go against the grain. Tears that go with the grain of the paper will usually be smooth and straight while tears that go against the grain will tend to have more feathered edges and will curve as they try to align themselves with the paper grain.

In **simple paper tears** the page has been torn one time and the tear has an obvious top and bottom. This is easy to see when the tear passes through the text or illustrations.

Complex tears are really more than one tear. When a torn page is not repaired, the page can easily tear again and the second tear can have a different top and bottom. Always look at the tear and lay the edges in position before applying adhesive to make sure the tear is in the correct

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position. If the edges are not in the correct position, the repair will not lie flat and the text or illustration may be obscured.

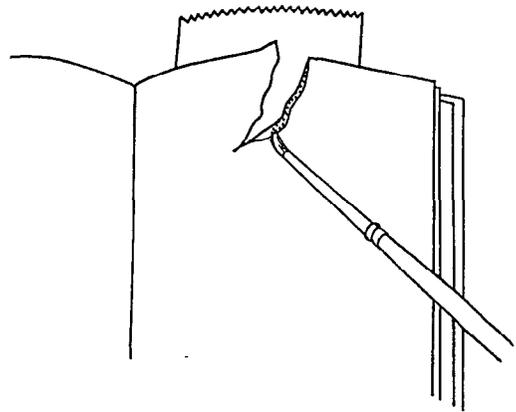
There are three ways to repair paper tears in conservation book repair:

- using wheat paste alone
- wheat paste with Japanese repair tissue
- document repair tape.

Repairing Tears With Wheat Paste Alone

When the paper tear has a strong, obvious top and bottom edge, applying wheat paste to the edges of the tear can be enough to bond them together.

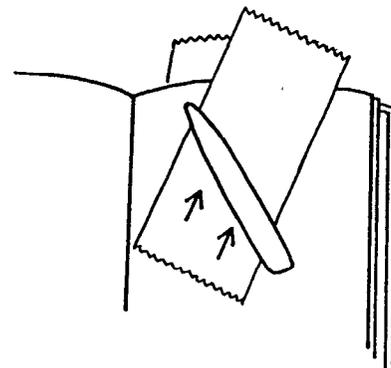
Use a very fine paint brush, microspatula or needle to apply wheat paste to the top and bottom edges of the tear and press them together.

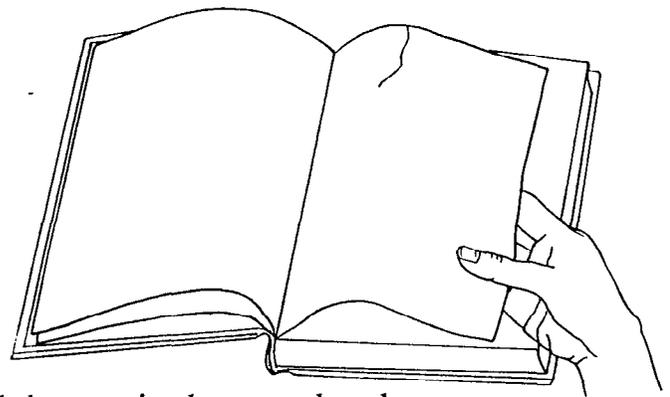
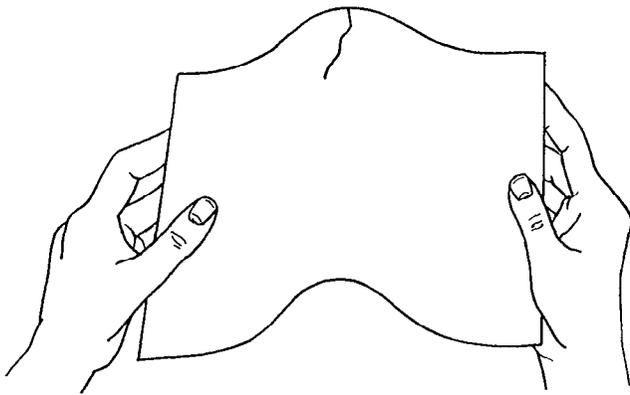


Cover the repair with wax paper or Hollytex and press the edges of the tear together with a folder.

Remember to always best to work from the base of the repair toward the edge of the page.

Wipe away any excess paste that is forced out of the edge of the tear. Note how much excess paste was used and try to use less for the next repair. Always aim for enough paste; not too little, not too much.





When the repair is dry, curl the paper around the repaired tear and make sure all the edges are well adhered.

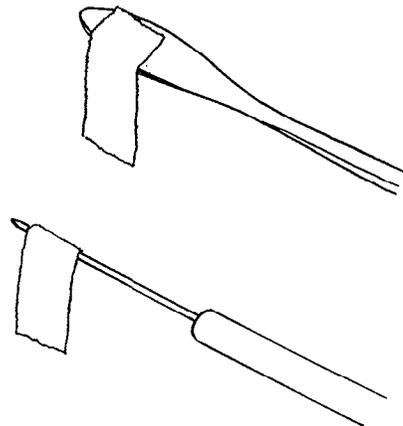
If there are loose edges, repaste and dry under weight. If the page creases at the repair, consider applying a **Japanese repair tissue** (below) patch over the repair. If the tear is not properly aligned, moisten the area with water to release the repair and redo it.

Repairing Tears With Japanese Repair Tissue Patch and Wheat Paste

Japanese repair tissue adds strength to a repair. It is used when the tear does not have wide, overlapping edges and needs reinforcement.

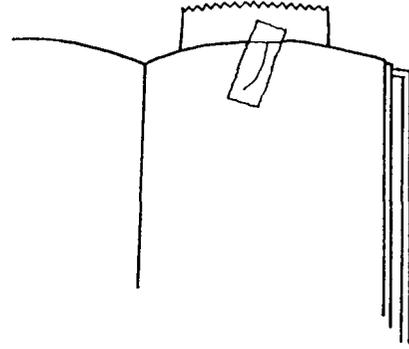
Read **BOOK REPAIR TOOLS AND TECHNIQUES** (page 27) for instructions on tearing and applying paste to Japanese repair tissue. Choose the best method for tearing and applying paste before beginning the repair.

Apply paste on the Japanese repair tissue, then pick up the tissue using a needle, microspatula or fine tweezers.

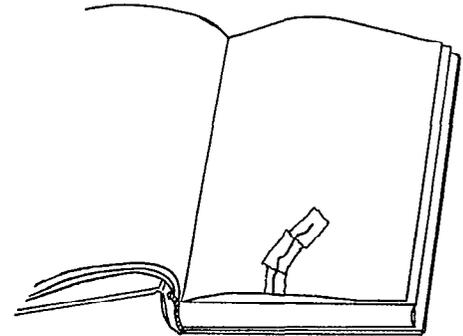


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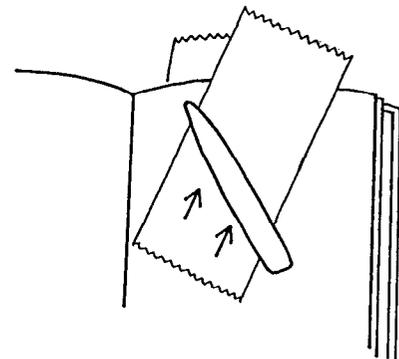
Carefully lay the tissue on the tear. If the tear is at the edge of the page, extend the Japanese tissue $\frac{3}{8}$ " past the edge of the paper. This extension can be turned under now or trimmed when the repair is dry.



It can be difficult to work with a piece of Japanese repair tissue over 3" so try repairing long tears with several short, overlapping pieces of Japanese tissue. While it may seem inviting to use one long piece of tissue, it is much harder to control, and the finished repair can look clumsy.



Once the pasted Japanese tissue is laid over the tear, cover it with a strip of wax paper and use a folder to gently press the edges of the tear together. Remember to always work from the base of the repair toward the edge of the page.



Wipe away any excess paste that is forced out of the edge of the tear. If there is much excess, use less next time.

When the entire tear is repaired, cover it with wax paper or non-stick material and blotter paper, then put it under weight. Remember, if the repair does not dry under weight, the paper can buckle and curl.

After the repair is dry, curl the paper around the tear and make sure all the edges are well adhered. If there are loose edges, repaste and dry under weight. If the page creases at the repair, consider applying a second Japanese repair tissue patch on the opposite side of the original repair.

Repairing Tears With Document Repair Tape

Document repair tape is discussed on page 18. In general, it should only be used on books that are not valuable or part of a library's permanent collection.

Make sure the edges of the tear are lined up correctly and apply the tape over the tear. Do not try to repair a long tear with only one piece of tape. If necessary, apply tape on both sides of the paper to attach loose edges but remember that this will add two extra layers of thickness to the book.

Archival tapes are usually 5/8 to 1" wide. Tape that wide can often be cut in half or thirds so as to lessen the amount of tape used in each book. In addition to saving money, it will also be better for the book. When tape is applied to both sides of a repair, cut the second piece a little wider than the first so the edges are offset.

2. REPAIRING PAPER CUTS

Paper cuts slice completely through the paper fibers so they do not have a top or bottom feathered edge. Paper cuts must be repaired with a Japanese repair tissue patch or document repair tape. Since the cut is unsupported, it might be better to put repair tissue on both sides of the cut or wrap a short amount of the Japanese repair tissue or document repair tape around to the back side of the repair to reinforce the repair. Follow the instructions for applying Japanese Repair Tissue Patch and Wheat Paste or Applying Document Repair Tape.

3. REPAIRING PAPER LOSSES

It is not too common to find holes in the middle of the page, but it can happen. While the print can not be restored, the page should be mended to prevent further damage.

Choose two layers of Japanese tissue that will be close in thickness to the repaired page.

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Tear two pieces of Japanese tissue to cover the hole using the techniques covered in **TEAR A JAPANESE TISSUE PATCH OVER THE DAMAGED AREA**, page 34.

Protect the text block with wax paper on either side of the damaged page.

Paste up one piece of Japanese tissue, position it on the page and work the edges into place. Paste up the second piece of repair tissue and lay it in place, working edges down with a folder.

Cover with wax paper or non-stick material and blotter. dry under weight.

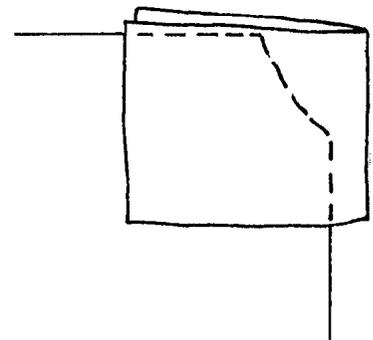
After the repair is dry, curl the paper around the tear (page 53) to ensure all the edges are well adhered. If the edges are loose, repaste and dry under weight, then test again.

4. REPAIRING MISSING PAGE CORNERS

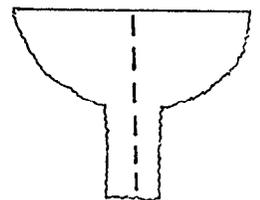
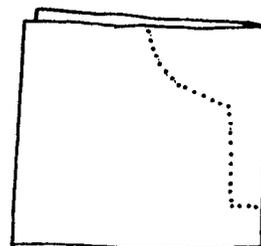
Choose two layers of Japanese tissue that together will be close in thickness to the repaired page.

Protect the pages behind the repair with wax paper. Use a piece of black mat board to highlight the edge of the repair.

Fold a piece of Japanese tissue in half and place over the missing corner. The edges of the patch should extend past the edges of the page.



Needle or water tear (page 33) the two layers of tissue. The patch should be about 1/16" wider than the loss.



Apply paste to the repair patch (page 34) and position the repair patch on one side of the missing corner. Work the edge of the patch into place.

Fold the patch over and work the edges of the patch into the page.

Dry under weight and trim any excess margin.

After the repair is dry, curl the paper around the tear (page 53) to ensure all the edges are well adhered. If the edges are loose, repaste and dry under weight, then test again.