

## **Revised:** Transformation of a Personal Grooming Tool into a Paper Perforating Pen

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Conservators routinely cut and shape paper with needles and scalpels when filling losses in artifacts. This is often tedious and hard on the hands. A poster presented at the 2014 AIC Annual Conference [www.conservation-us.org/docs/default-source/annualmeeting/2014am\\_poster11\\_transformation\\_of\\_personal\\_grooming.pdf?sfvrsn=2](http://www.conservation-us.org/docs/default-source/annualmeeting/2014am_poster11_transformation_of_personal_grooming.pdf?sfvrsn=2) described in detail how to convert a nose hair trimmer into a paper perforating pen using readily available materials. The pen, when paired with a cushioned cutting base, can be used to effortlessly draw a series of small holes in a fluid motion. The pen, when paired with a cushioned cutting base, can be used to effortlessly draw a series of small holes in a fluid motion. The perforated line is then pulled apart to create a feathered edge. Recent changes in the design of the trimmer by the manufacturer made the assembly outlined in the poster no longer possible. This was an opportunity to rework the assembly in order to simplify the process. Outlined below are instructions for making the second generation perforator that is new and improved. The assembly is straight forward and takes approximately 30 mins to make.



Philips Norelco Nose Trimmer 3000



Remove the colored plastic frame by gently prying with a fingernail or small tool. Set the frame aside.



Grasp the blade with a small pliers, rocking gently side to side to detach it from the plastic arm.



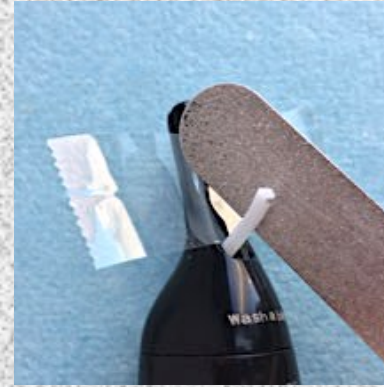
Discard the blade. Save the plastic frame to re-install later.



Remove the small metal barrel from a Paper Mate 9mm mechanical pencil. Pull out the plastic insert. Keep the metal barrel only.



Place a piece of tape behind the plastic arm to keep it leaning forward.



With a file, narrow the plastic arm so that the metal barrel will fit over it. The easiest way to do this is to file down the square sides of the arm. The barrel should cover approx. 1/8" of the arm from the top down.



snugly on the arm. It can be crimped to the arm with a small pliers. No adhesive is needed.

Push the metal barrel down onto the arm until the barrel begins to taper. There will be an empty space at the tip that will be used to hold the needle. The barrel should fit



With a small push drill or heated awl make a hole in the top of the trimmer head large enough for a sewing needle to slide easily in and out.



Remove a the plastic nose cone from the Pentel Quick Click 7mm lead pencil. Using a needle pull out the small gasket inside. Discard it. Keep the cone and discard the rest of the pencil.



Choose a sewing needle that will easily slide through the cone tip. Cut the needle 1-1/8 inches long.



Put a drop of epoxy into the hole in the tip of the metal barrel. Remove the tape. Insert the sewing needle through the hole in the top of the trimmer head and down into the hole in the metal barrel. Let epoxy dry completely. Snap the plastic frame back onto the trimmer. It helps to focus the movement of the needle.



Place the nose cone onto the trimmer head making sure the needle slides easily through the metal tip of the cone. Push the cone firmly down angling it in line with the trimmer head. No adhesive is needed. Now test the pen on a mousepad with a scrap of paper. The needle should perforate smoothly and it should protrude from the cone 1/32-1/16". These measurements are approximate and a little trial and error is to be expected.



The completed perforating pen ready to use

## How To Use The Pen



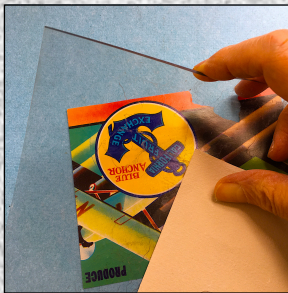
The pen must be used on a cushioned base such as a mousepad (nylon fabric bonded to rubber) in order to work smoothly. A large gaming mousepad is ideal. The tool should perforate paper with a fluid movement like drawing with a pencil. If it catches in the paper while perforating, the needle is too long. The nose cone is easily removed and the needle can be pulled from the metal barrel and shortened. Ethyl alcohol can often be used to soften the epoxy enough to remove the needle to cut it.

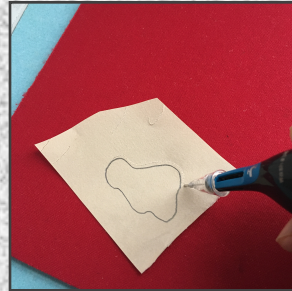


There are several techniques that can be used to customize the infill cutting process depending on the artifact being repaired and the weight of the fill paper chosen.

### Option 1

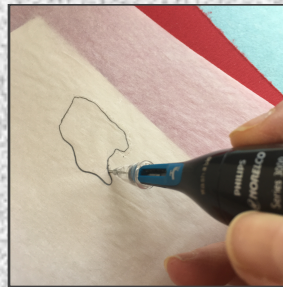
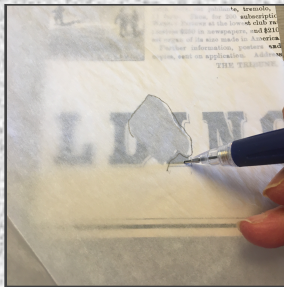
Put the artifact on a light table and place a clear vinyl sheet (40 mil thick) on top. Position the fill paper of choice on top of the vinyl sheet over the loss. Draw with the perforating pen along the outside edges to get a fill slightly larger than the loss. Holding the pen at an angle and using light pressure while perforating on the vinyl will reduce the bounce. Pull the perforated lines apart to remove the fill. When working with heavier papers, wetting with a damp cotton swab around the outline first will make perforating easier. Perforating a line from the outline to the paper's edge makes it easier to remove the fill.





### Option 2

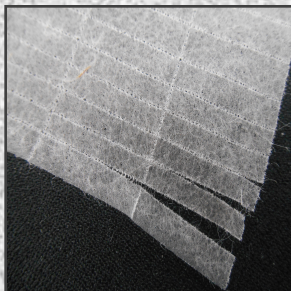
Working on a light table, place the fill paper of choice over the loss in the artifact. Trace the outline slightly larger than the loss with a pencil. Transfer the fill paper to a mousepad. Perforate through the fill paper just inside pencil line. Pull perforated lines apart to remove the fill.



### Option 3

Place a sheet of glassine over the artifact. Trace the outline slightly larger than the loss with a pencil. Place the tracing of the loss over the fill paper of choice on a mousepad. Perforate with the pen through both the sheets. Pull the perforated lines apart to remove the fill.

## Perforating Strips for Mending



Strips for mending can be made in advance, by drawing parallel lines across a sheet of paper with a perforating pen & ruler. They can be pulled apart for use when needed. Sheets can be perforated in long strips or in a grid pattern. Varying the distance between the grid lines creates mending strips in a range of sizes ready to use. With heat- or solvent-set tissues, the punched edge gives the illusion of being feathered while keeping the adhesive on the verso intact. When applied, the perforated edge is subtle & almost invisible. Folding punched lines before pulling apart makes the separation of narrow strips easier.

## **TIPS**

**SPEED:** Holes are punched farther apart the faster the pen is moved across the paper. The distance between holes determines the degree of feathering along the perforated edge.

**WATER or SOLVENT:** These can be painted onto perforated lines to increase feathering and make tearing apart easier. They can also be used to dampen paper before perforating, sometimes useful when working with heavy weight papers.

**PRESSURE:** The pens work best using light pressure.

**STROKE:** A series of small closely spaced strokes or zig-zags can be also be used.

**GRAIN DIRECTION:** For machine-made, long-fibered tissues it is easier to separate perforated lines if they are drawn parallel with grain.

**SHUT DOWN:** Turn the pen on & off several times and the needle will retract fully into the nose cone.

**SHARPENING:** Should the needle become dull, it can be sharpened using the emery-filled baby bud on a tomato pincushion.

## **TROUBLESHOOTING: PEN CATCHES IN PAPER**

**NEEDLE LENGTH:** The needle may be too long. Try shortening it.

**NOSE CONE:** Tilt the cone until it is in alignment with the sewing needle and trimmer head. The needle should work in and out without bending.

**BATTERY:** The tool will slow as the battery loses power, sometimes catching in the paper. Replace the battery.

**LOOSE PARTS:** Crimp the metal barrel again with a pliers. The plastic parts of the tool cannot be bonded with adhesive. The tool has been designed so that the plastic & metal parts are held together by friction.

## Supply List

- **Philips Norelco Nose Trimmer 3000: Amazon, Walgreens, Duane Reade & other pharmacies**
- **Pentel Quick Click 7mm Mechanical Pencil: Amazon, Staples, Office Max**
- **Paper Mate Clearpoint 9mm Mechanical Pencil: Amazon, Staples, Office Max**
- **Sewing Needles: Michaels, Joann's**
- **Elmer's Super Fast Epoxy Cement (for best results): Amazon, Home Depot,**
- **Clear Vinyl Film (40 mil thick): TAP plastics, Ebay**
- **Mousepad (nylon fabric bonded to rubber base): Amazon, Staples, W.B. Mason**
- **Large Gaming mousepad (fabric bonded to rubber base): Amazon**

## Tools

- **Small pliers**
- **File (a thin metal nail file works well)**
- **Disposable gloves**
- **Small disposable dish for mixing epoxy**
- **Disposable stick for mixing epoxy**
- **Small push drill or awl**
- **Pressure-sensitive tape**

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