

**MECH 4V96  
Shop Design  
Mechanical Engineering  
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**Brother PE535 Embroidery Machine  
and Inkscape User Manual  
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## I. AutoCAD and Inkscape Operation

Before beginning, make sure you have AutoCAD, and [Inkscape](#) and its [Ink/Stitch](#) extension downloaded. Follow the steps on their websites to successfully install the software.

1. Download a .dwg file from the Internet and open it on AutoCAD, create your own drawing on AutoCAD. In the example shown below, a gear drawing from McMaster-Carr was opened in AutoCAD and edited so that only the gear teeth show, with a circle added onto the inside of the design (Fig. 1). Once done, save the drawing as a .dxf file.

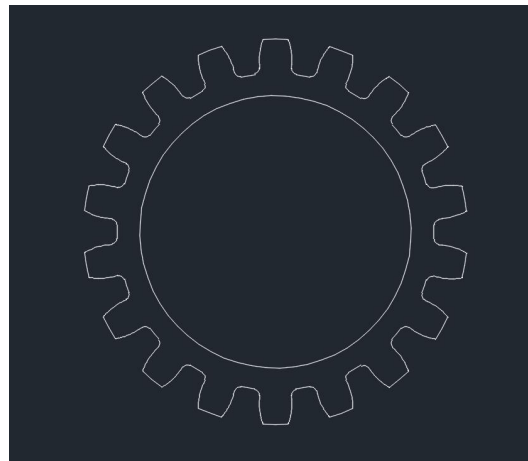
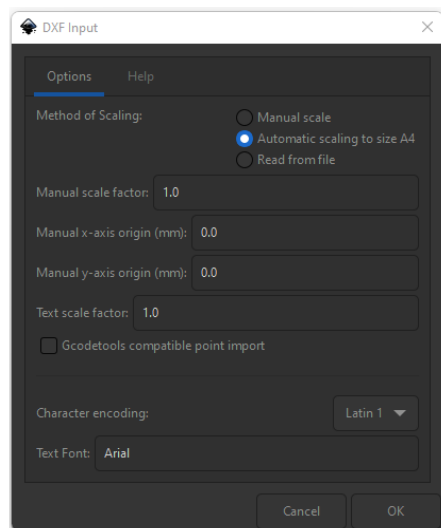
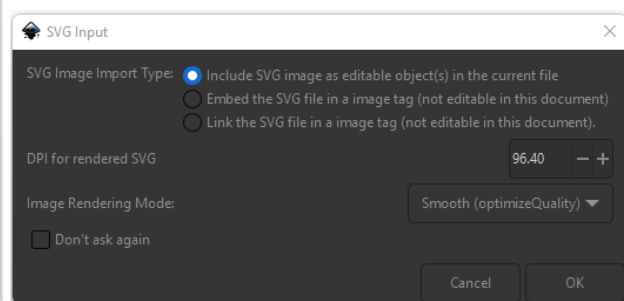


Fig. 1

2. Open Inkscape and create a new document. Import your .dxf file into the software by going to File > Import, and then selecting your file. In the popup menu that appears, make sure “Automatic Scaling to size A4” is selected and click OK (Fig. 2a). In the next popup menu, Make sure that “Include SVG image as editable object(s) in the current file” and “Smooth (optimizeQuality)” are selected (Fig. 2b) and click OK.



a)



b)

Fig. 2

3. Move the selected image so that the image appears on the A4 page shown on screen. Resize the image so that it is smaller within the page. Go to File > Export PNG Image to export the file as a .png. In the menu on the right of the screen, select the directory you wish to save the file in and click Export.

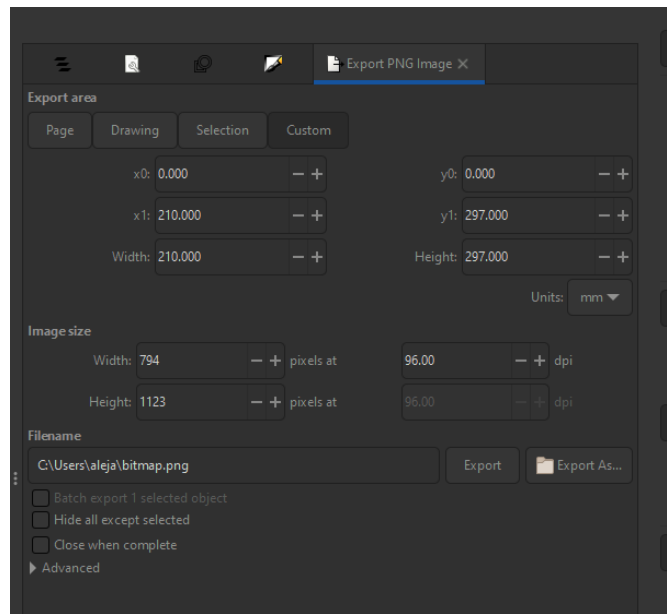


Fig. 3

Note: Hold down CTRL while using the corner arrows to resize the image. Not doing so will distort the image's proportions.

4. Create a new document and import the .png file into the document. In the popup menu, select "Embed," "From file" and "Smooth (optimizeQuality)" and click OK. Move the image so that it is on the A4 page.

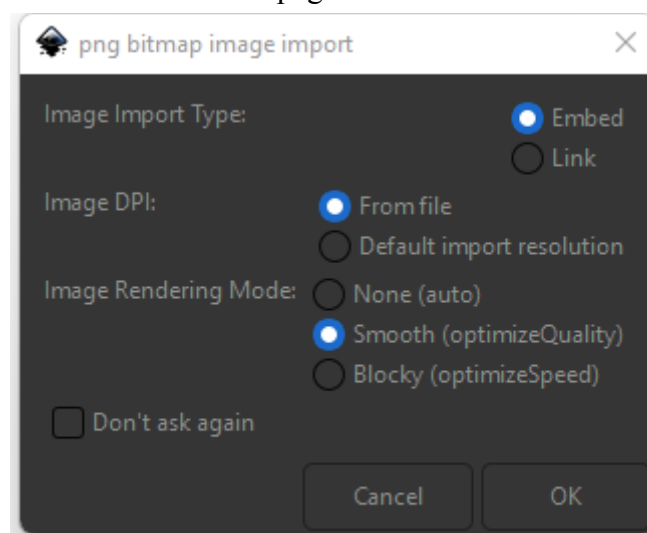
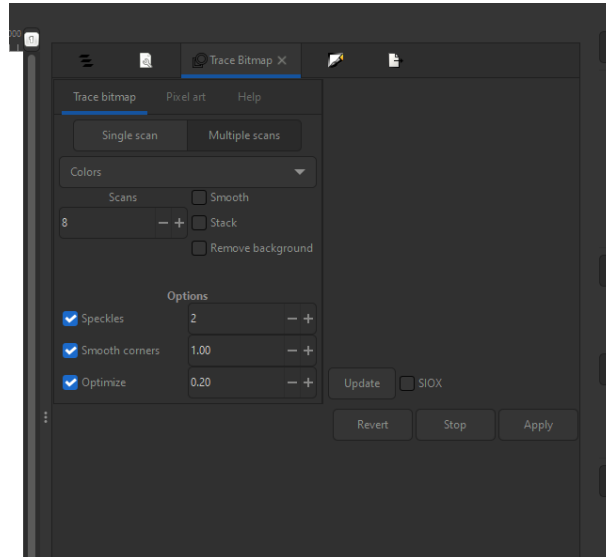
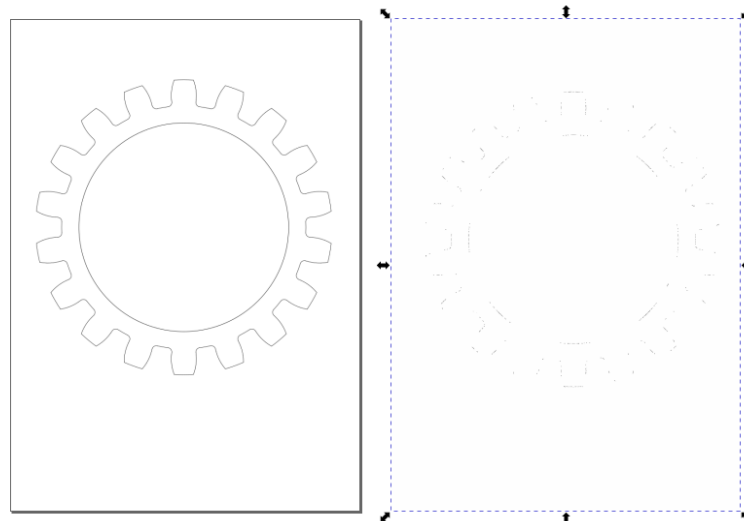


Fig. 4

5. Go to Path > Trace Bitmap. In the menu that shows on the right of the screen, make sure that “Multiple scans” and “Colors” are selected (Fig. 5a). Click “Update” and “Apply.” You have now traced the bitmap of your image. Select the bitmap (it should be on top of the image) and move it to the side of the page (Fig. 5b). Then, select the image on the A4 page and press Delete.



a)

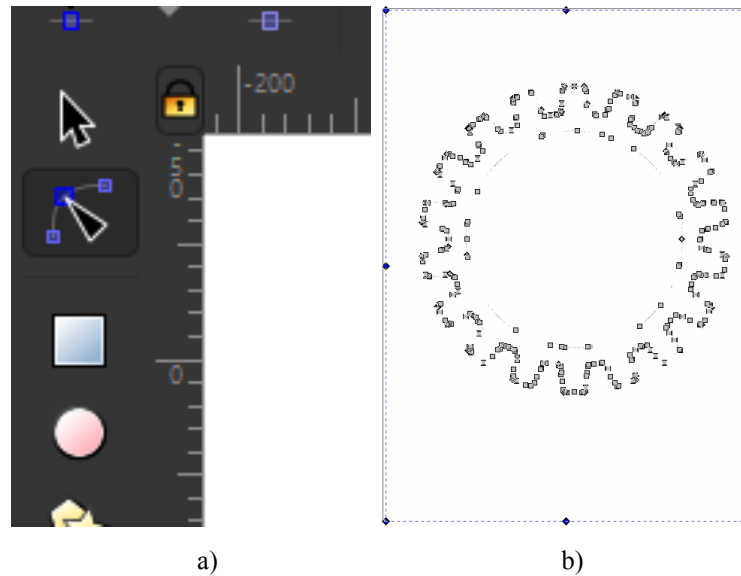


b)

**Fig. 5**



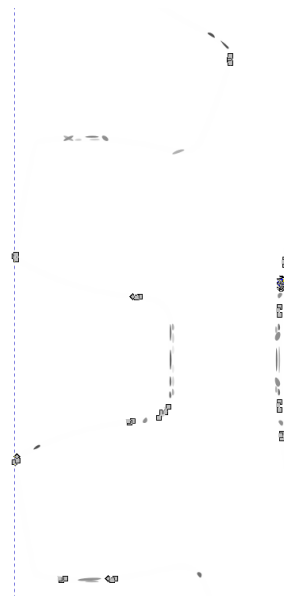
6. Move the bitmap onto the A4 page and select the “Edit paths by nodes” button (Fig. 6a). Hover over the image, and click the bitmap when it is highlighted in red. Nodes will appear that trace around every shape in the image. For each shape that is not needed in the design, click on one of its nodes so the node turns blue. While hovering over the node (so it turns red), hold CTRL and scroll using the middle mouse button until every node of the shape is selected/turns blue (Fig. 6b). Click Delete.



**Fig. 6**

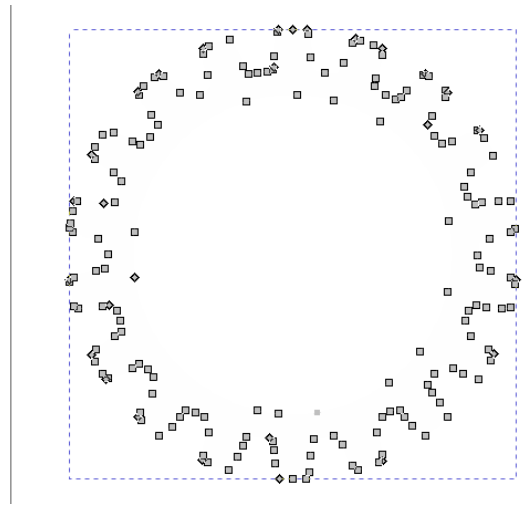
In the example shown above, the nodes for the rectangle around the gear are selected and deleted. The same process was done for the circle inside the gear.

Note: You may also see smaller shapes when you zoom in to see and delete the nodes. These need to be deleted as well as they are not a part of the actual design. While “Edit paths by nodes” is selected, click on one of the shapes, and hold and drag the mouse over the shapes to select them and delete (Fig. 7). This may need to be done several times to delete all the unnecessary shapes.

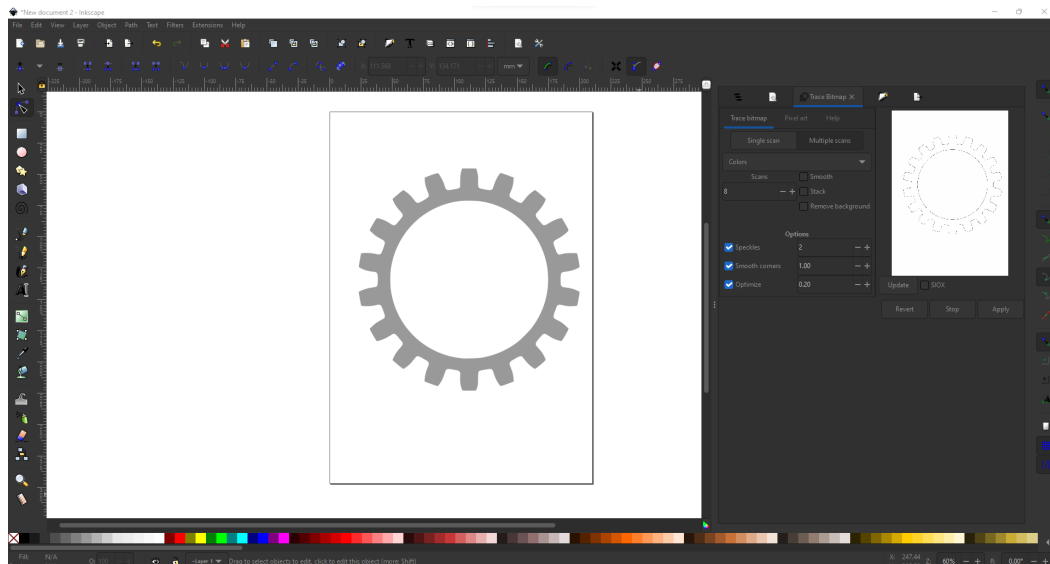


**Fig. 7**

7. You should only have the shapes that you want for the design at this point. Continue to have “Edit paths by nodes” selected. For each shape, click on a node and select your desired color from the options on the bottom of the screen (Fig. 8a and 8b).



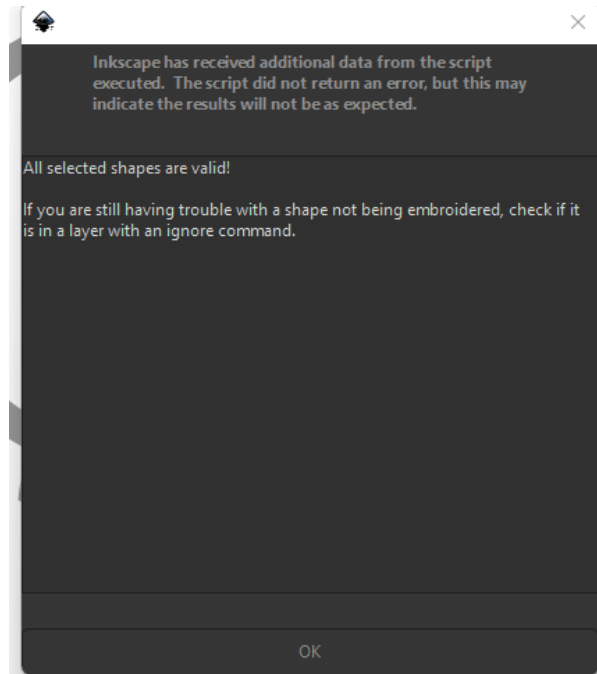
a)



b)

Fig. 8

8. Before moving on, go to Extensions > Ink/Stitch > Troubleshoot > Troubleshoot Objects. If your shapes are valid, the popup shown in Fig. 9 will show. If there are any issues, go to Extensions > Ink/Stitch > Troubleshoot > Cleanup Document. Make sure “Remove Small Fill Areas” and “Remove Small strokes” are selected in the popup menu that appears and click Apply to clean up the document.



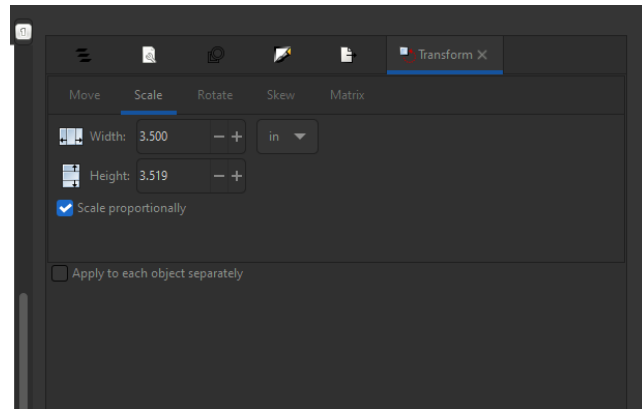
**Fig. 9**

9. Repeat Steps 1-8 to create the UTD monogram shown below in a separate document. Go to File > Save as and save it as a .svg file. Then, import this into the gear file and move it to the center of the gear (Fig. 10).



**Fig. 10**

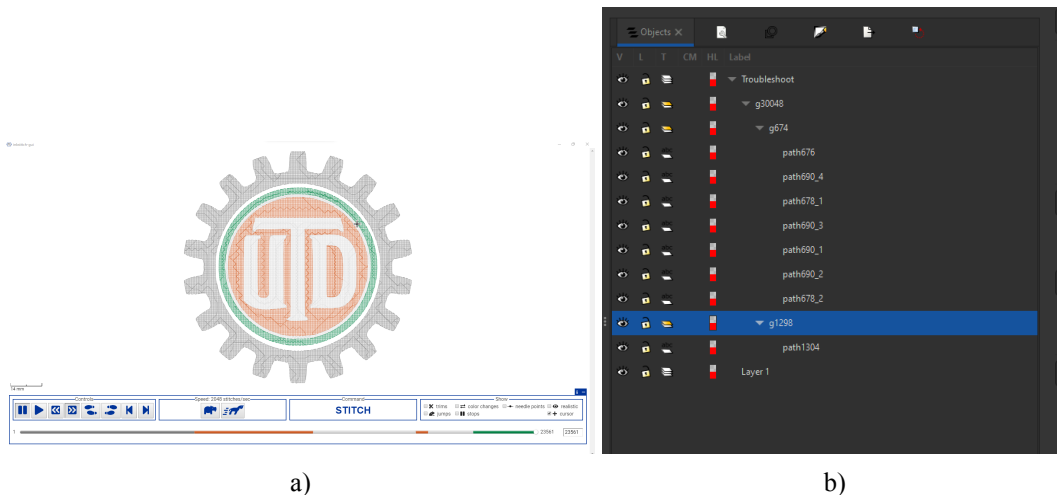
10. Click and drag over the entire final design to select it, and go to Object > Transform. In the menu that appears on the right, click Scale. Make sure “in” (inches) and “Scale proportionally” are selected, and scale it down so that the longest image dimension is below 3.9 inches (Fig. 11).



**Fig. 11**

Note: 3.9 inches is the largest scale the embroidery machine can take, so it would be best to scale the design down smaller than that for some allowance, and rescale as needed on the embroidery machine.

11. Go to Extensions > Ink/Stitch > Visualise and Export > Simulator / Realistic Preview. A window will open showing a simulation of how the design will be embroidered (Fig. 12a). If there are any issues with the order in which the shapes are embroidered, select Objects on the menu to the right of the screen (the first icon). Here, you will see names for each shape, which will be embroidered in order from top to bottom. Click and drag each name to move it up or down the order (Fig. 12b).



a)

b)

**Fig. 12**

12. Finally, move the design over to the top left corner of the A4 page (the origin) and go to File > Save As and save the design as a .pes file. Copy the file to a flash drive in preparation for importing into the embroidery machine.

Note: It is important that you move the design to the origin. Failure to do so will result in the embroidery machine outputting an error saying that your design is too large for the machine to embroider.

## II. Embroidery Machine Instructions

Below is a schematic of the major aspects of the embroidery machine and will be referenced for the instructions to follow.

Use only the included bobbin or bobbins of the same type.  
 Verwenden Sie nur die im Lieferumfang enthaltene Spule oder Spulen vom selben Typ.  
 N'utilisez que la canette fournie ou des canettes du même type.  
 Gebruik uitsluitend de bijgeleverde spoel of spoelen van hetzelfde type.  
 Utilizzare solo la bobina o le bobine in dotazione dello stesso tipo.  
 Utilice solo la bobina incluida, o bobinas del mismo tipo.  
 Somente use a bobina inclusa ou bobinas do mesmo tipo.  
 Используйте только прилагаемые шпульки или шпульки того же типа.

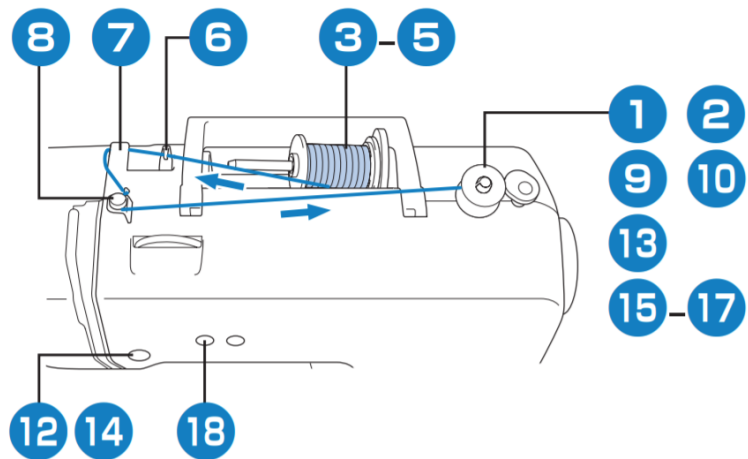
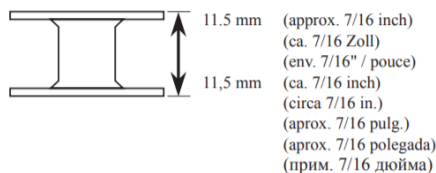


Fig. 13

### A. Winding the Bobbin

The bobbin must be the same color as the thread being used for the embroidery design. First an empty bobbin must be placed on the bobbin winder and pushed as far right as it will go (Steps 1&2) from Fig 14.

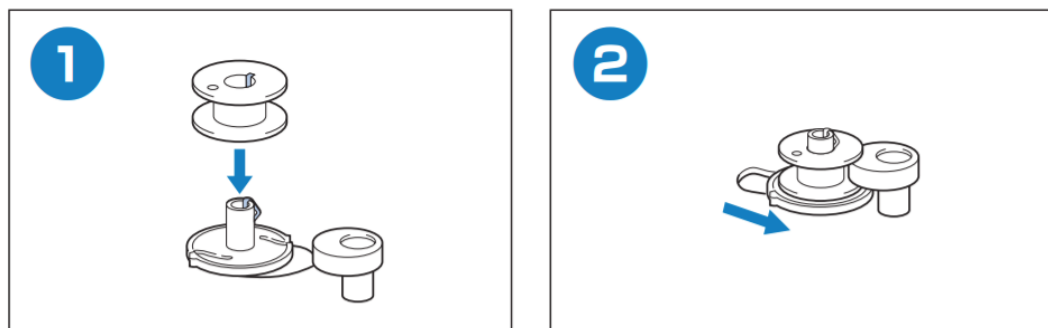
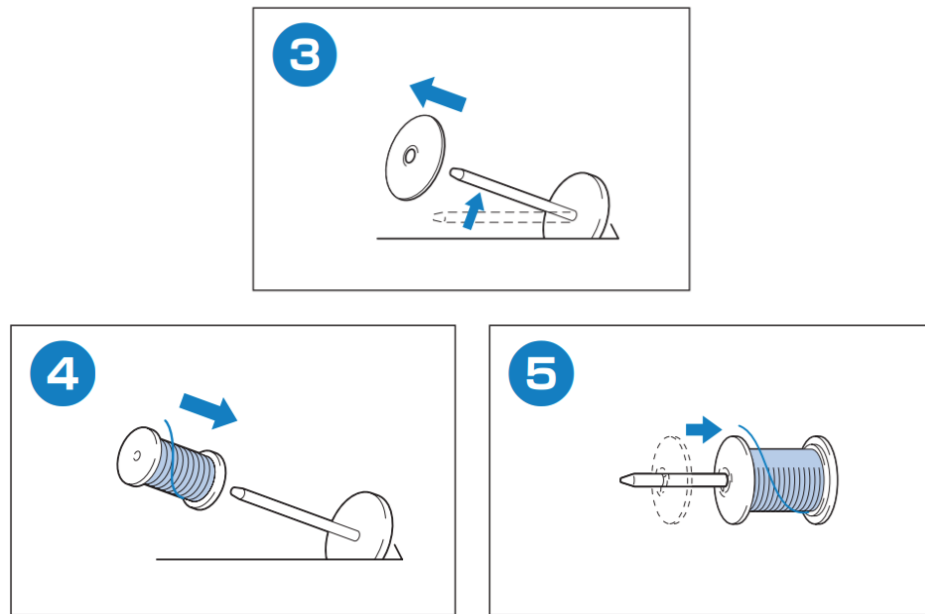


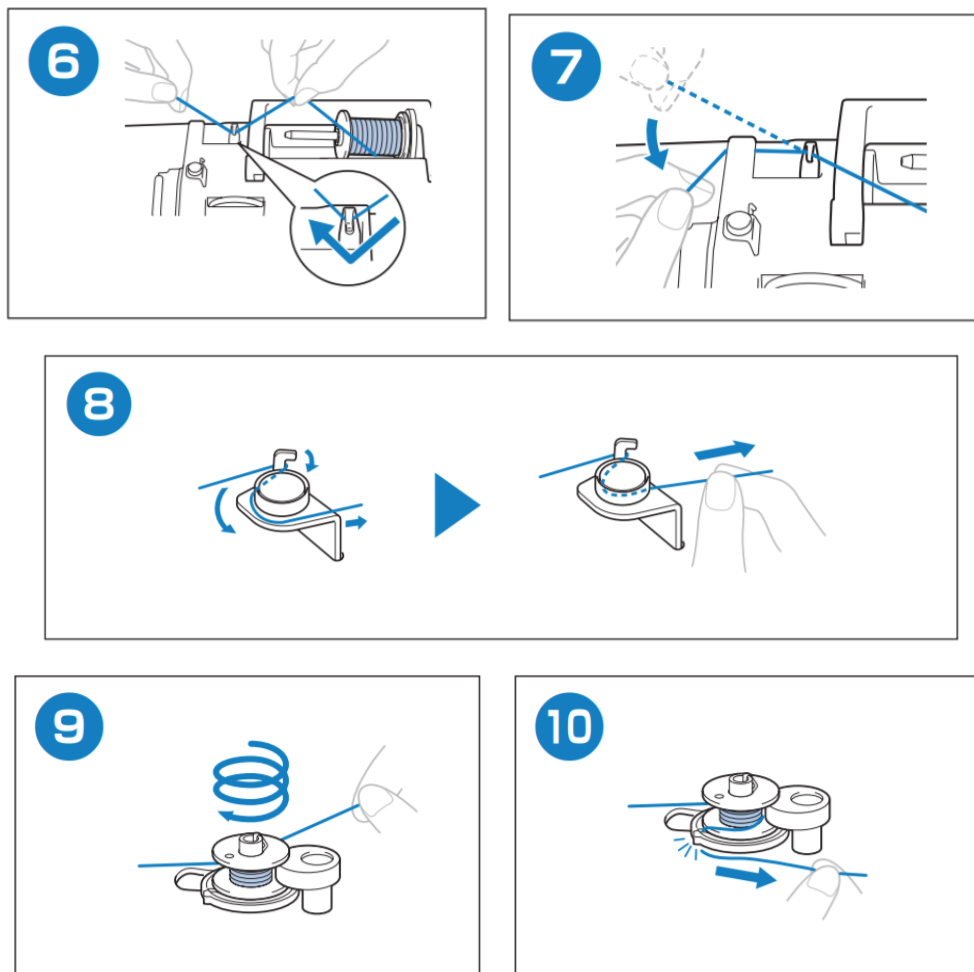
Fig 14

Then the thread spool needs to be placed on the spool holder and secured (Steps 3-5)



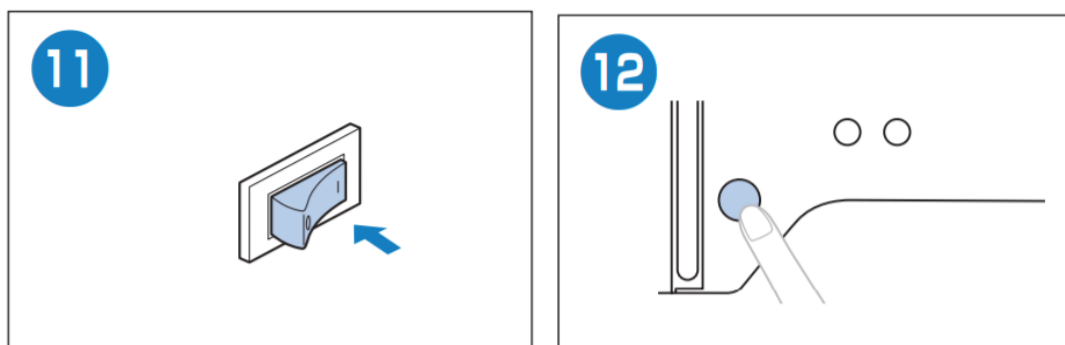
**Fig. 15**

Next, use the thread from the spool and wrap it following the path outlined in Steps 5-10. It is very important to make sure to cut the thread as shown in Step 10.



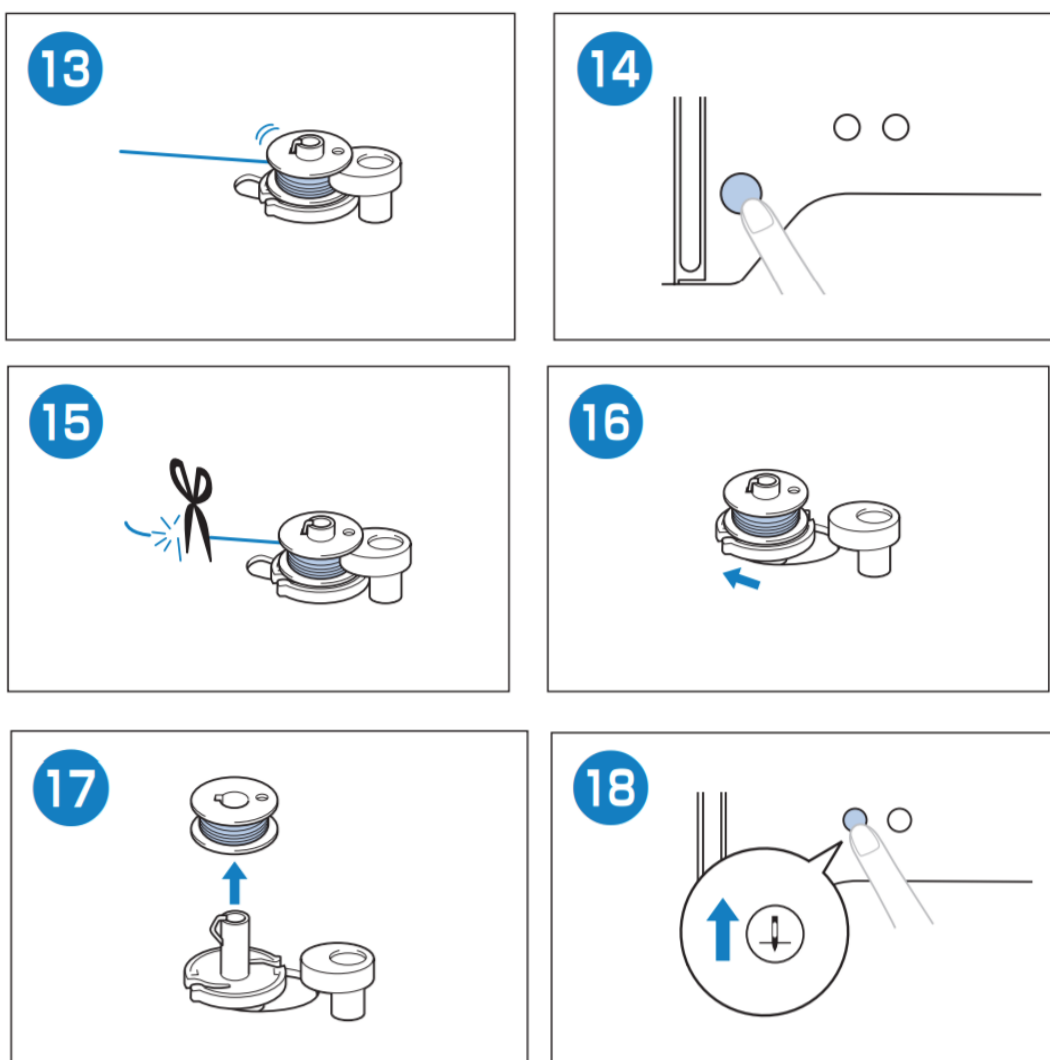
**Fig. 16**

Finally, turn on the machine on (Step 11) and press the green button (Step 12) to begin winding the bobbin. Watch the bobbin for the first 3 seconds ensuring it is not winding underneath the bobbin which is NOT ok.



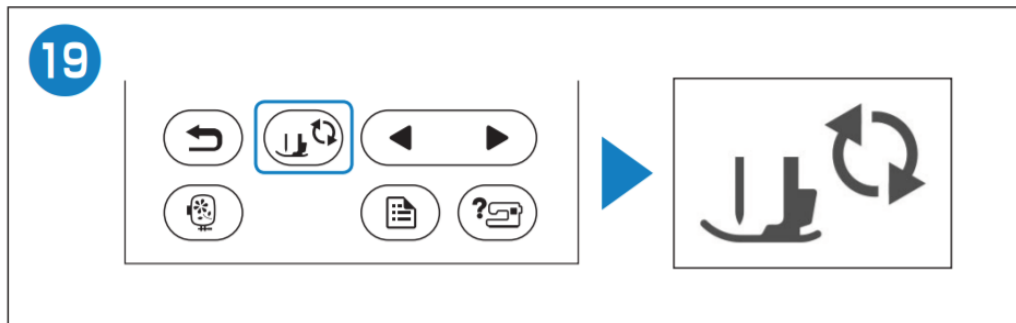
**Fig. 17**

Once you have ensured the bobbin is winding correctly, shown in Step 13, let it wind until it either stops or until you determine it has enough thread. Stop the winding by following Step 14 and continue to follow the instructions to install the bobbin in the bottom tray.



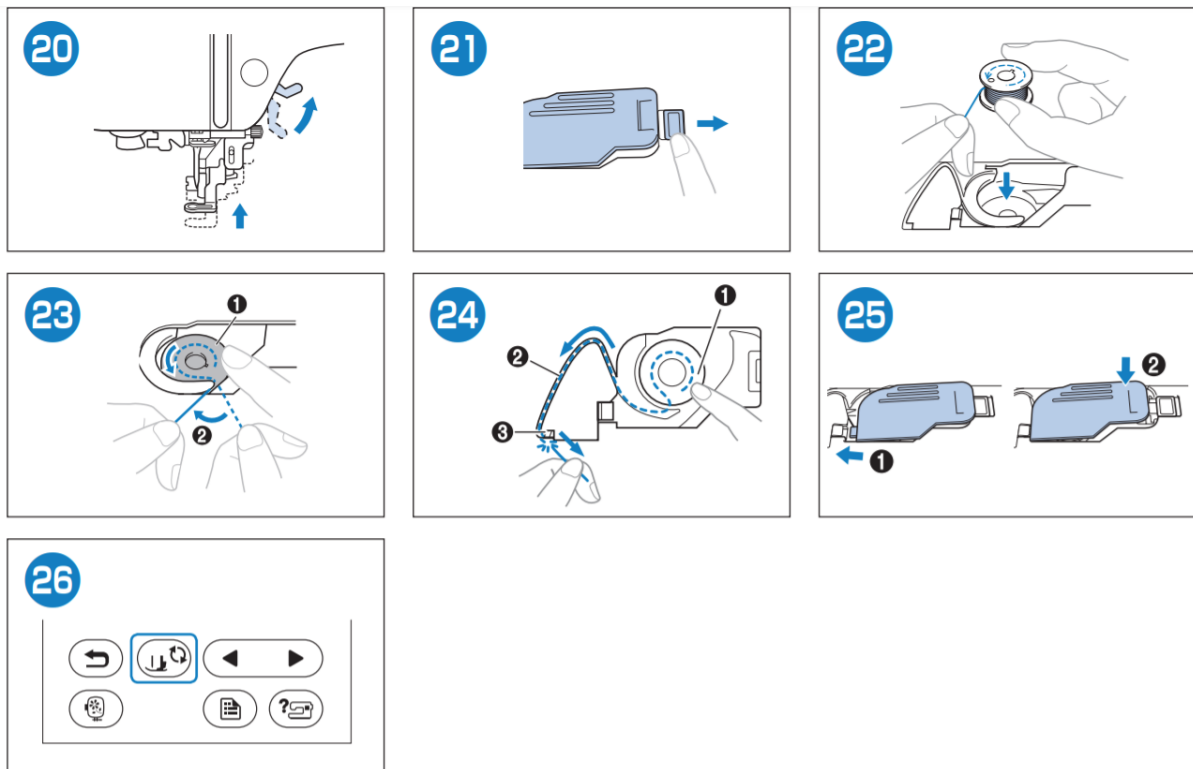
**Fig. 18**

Before placing the bobbin in the tray, click the button shown in Step 18 and the change thread button in Step 19.



**Fig. 19**

Continue by raising the sewing foot (Step 20), removing the bobbin cover and placing the bobbin with the thread facing correctly as shown in Step 22. Finish the steps and press the thread change button to complete the process.

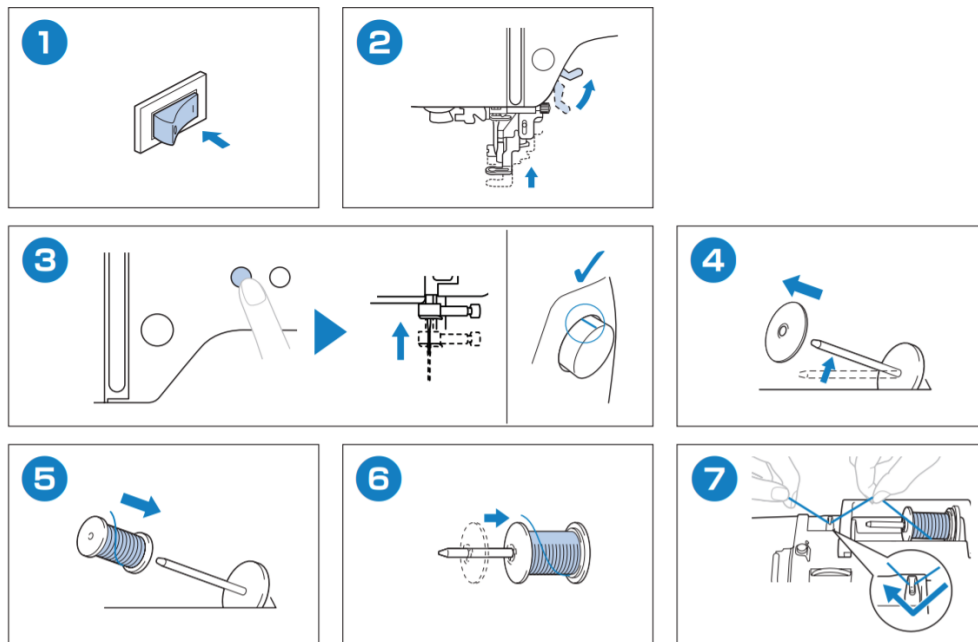


**Fig. 20**



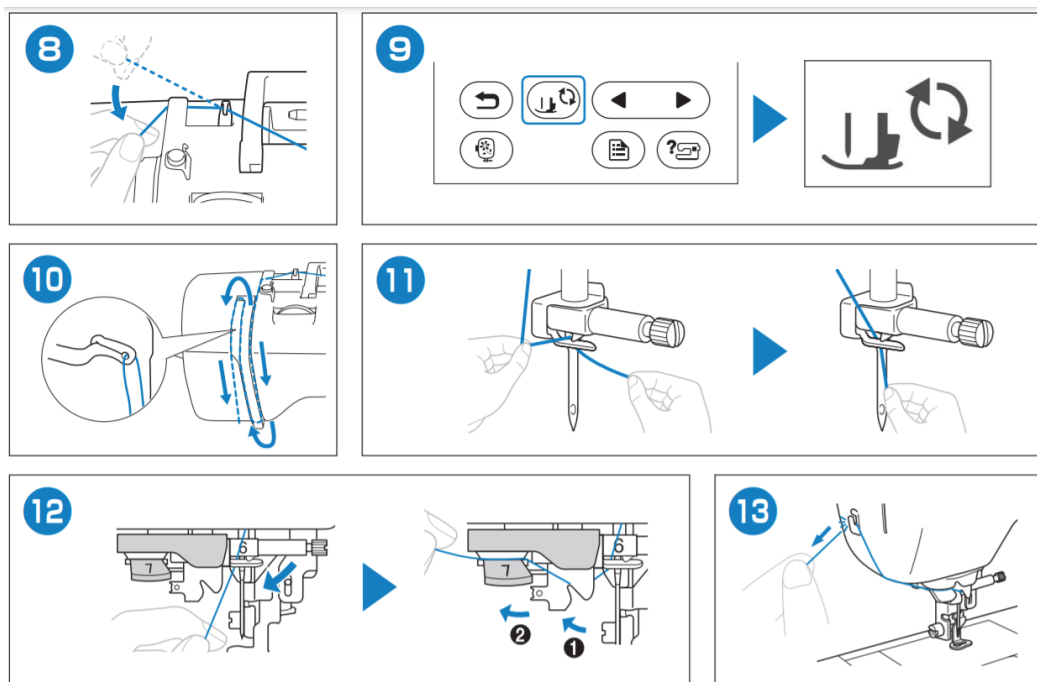
**B. Threading the Embroidery Machine**

Start by turning on the embroidery machine, and raising the foot (Step1-2). Then press the button shown in Step 3 and ensure the raise needle wheel is in the appropriate position (hashmark facing up). Pull enough thread to reach the needle with extra left over (about an arms length). Now, hold tension at the starting point with one finger holding the thread to semi-tight to the machine between the spool and the metal hook in step 7 while completing Steps 8-10.



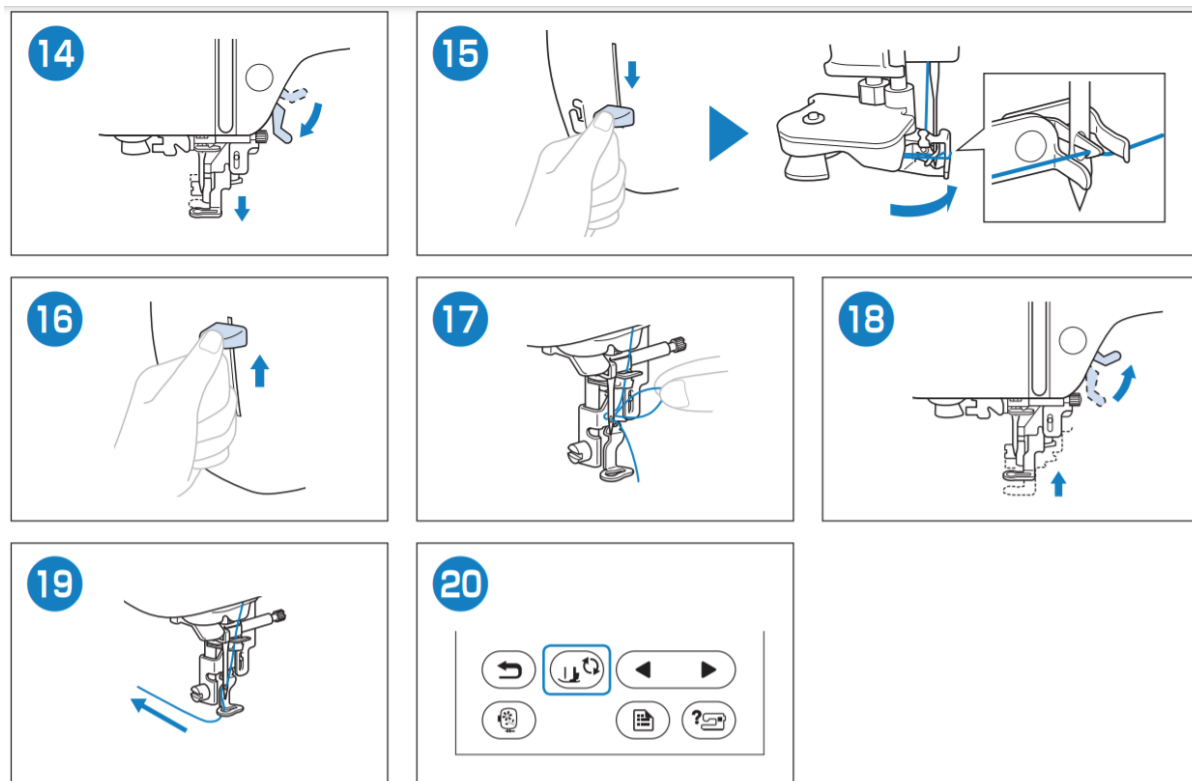
**Fig. 21**

On Step 10, be sure the thread goes over the hook.



**Fig. 22**

Before pushing the level down on Step 15 be sure to lower the foot (Step 14). After completing step 16, the needle should have a small loop of thread through it. Softly pull on the loop until it gets larger and eventually turns into a single thread.



**Fig. 23**

### C. Uploading Design onto Embroidery Machine

The following instructions are for uploading a design created using the steps from *I. Autocad and Inkscape Instructions* onto the machine in order to embroider.

First, plug in the USB device that contains your design into the port shown below which is located on the right side of the machine.



**Fig. 24**

Next follow the below on screen instructions to initiate the design.

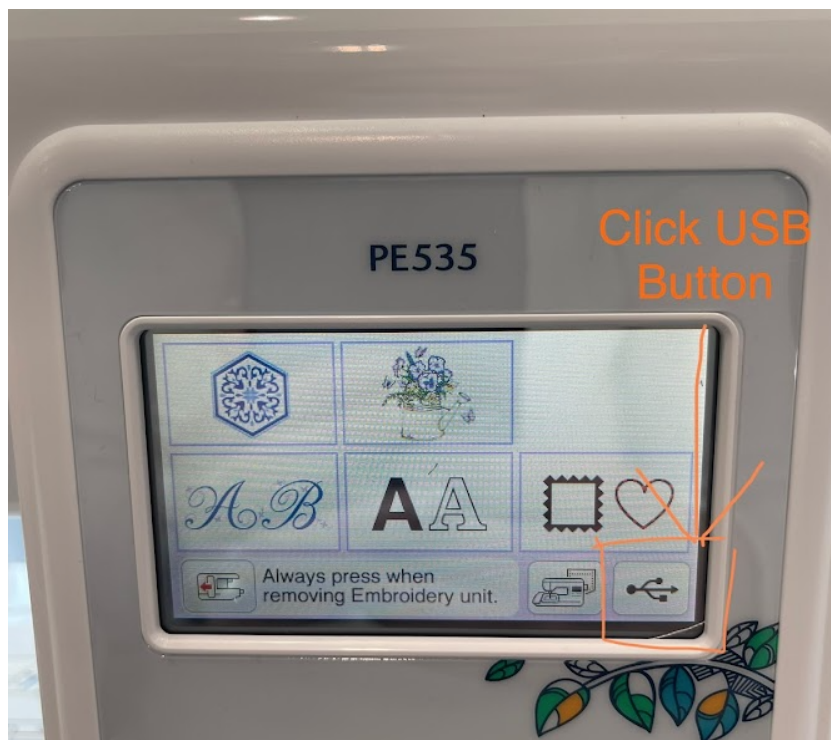


Fig. 25

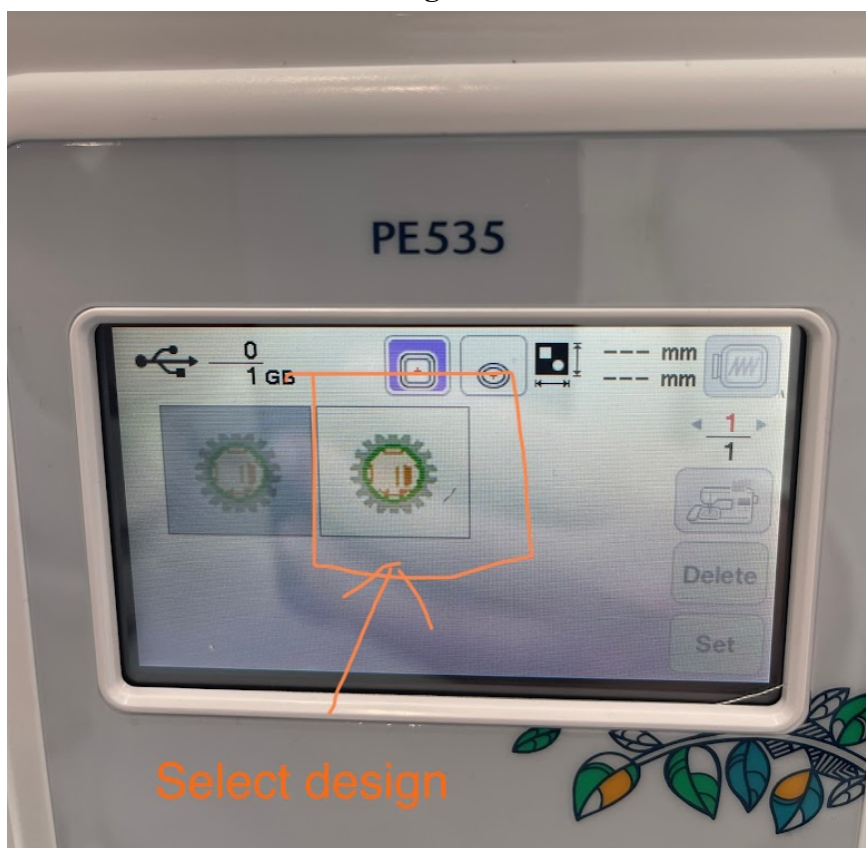


Fig. 26

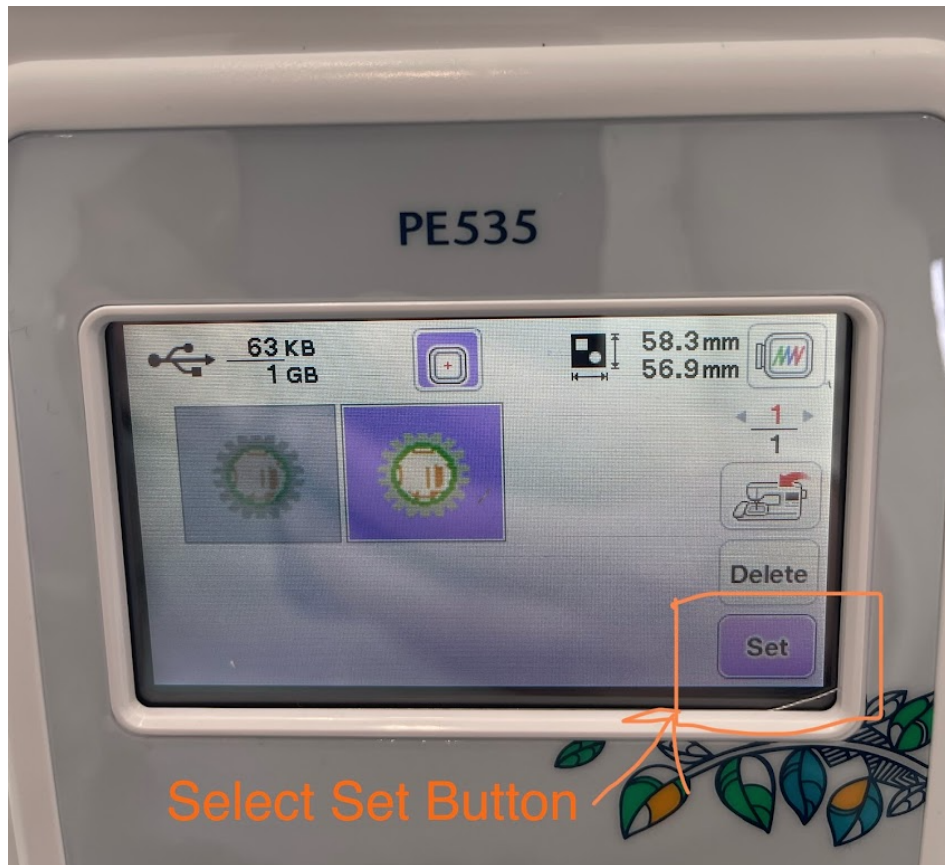


Fig. 27

Before selecting “Edit End” Button, check if the size, location and orientation is correct as shown on screen. If now, edit these by using the buttons circled in green shown below.

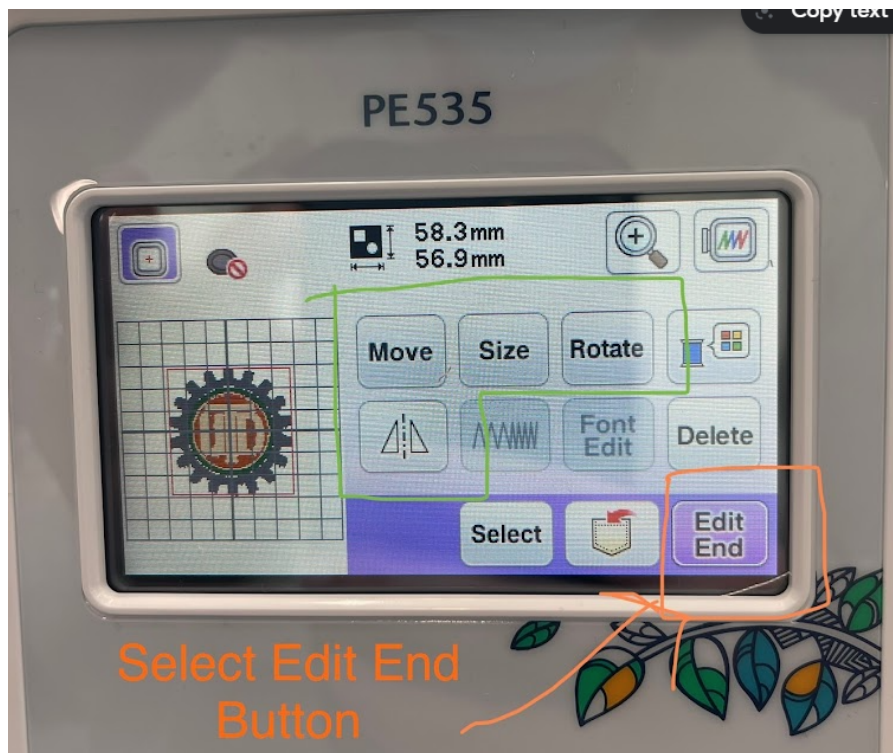


Fig. 28

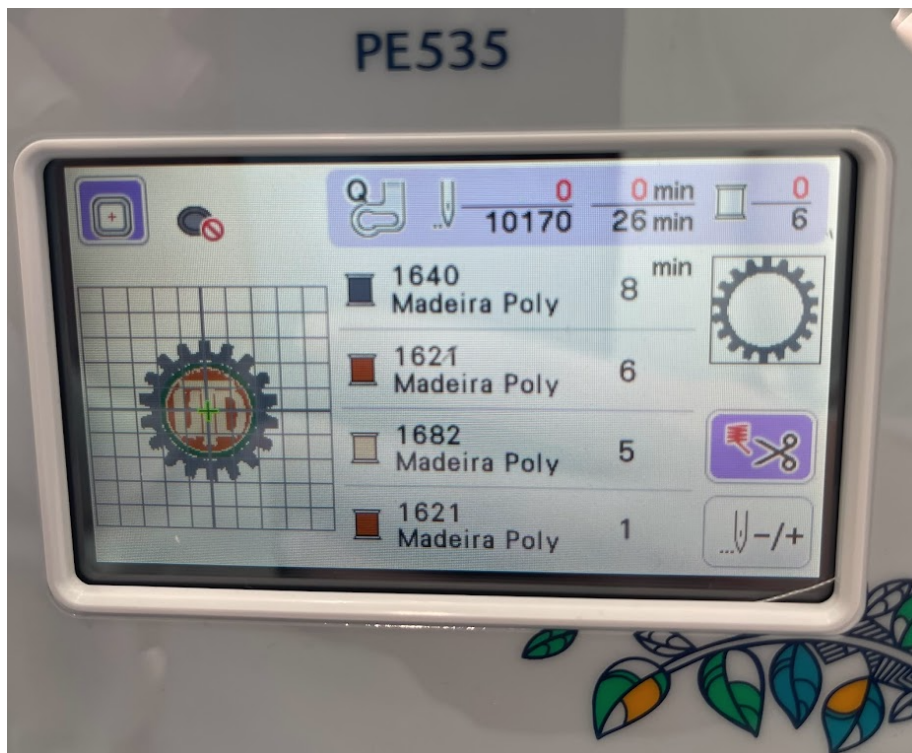


Below is the final view before embroidering the design. Ensure it is correctly sized and positioned before pressing the “Embroidery” Button.



**Fig. 29**

Now, the machine will show a preview of the design with the time it takes to embroider the total design (middle top), and the time for each part of the design. Toggle through each step to see the total time and design step of each part to ensure design is fully complete.



**Fig. 30**

Finally, press the green button to start the embroidery process.



**Fig. 31**

### III. Troubleshooting

#### ● Broken Needle

A common occurrence in embroidering is broken needles. Needles should be changed once every three bobbins and needle weights should always match the weight of the fabric you are working with. If a needle breaks, you will hear a loud grinding sound from the machine and see that the needle is no longer threading the fabric. It will only produce holes.

#### a. Stop the machine

To stop the machine, press the green button with the ↑ symbol. Be sure to mark down the needle stitch number. The figure below shows the location of the needle stitch number.

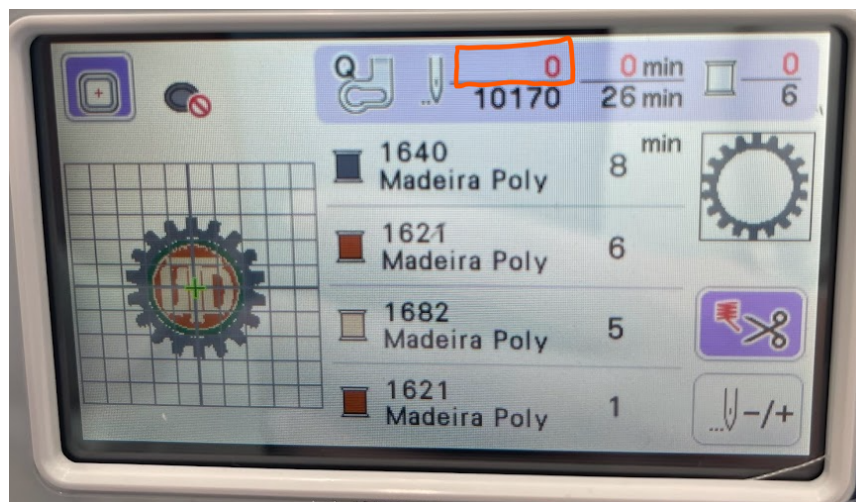


Fig. 32

#### b. Change the Needle



Follow the instructions below ensuring you have the correct needle type for the machine.

#### Replacing the needle


Use the screwdriver and a new needle that has been determined to be straight according to the instructions in "Checking the needle" on page 18.

- 1 Press ⊕ (Needle position button) once or twice to raise the needle.
- 2 Place fabric or paper under the presser foot to cover the hole in the needle plate to prevent the needle from falling into the machine.

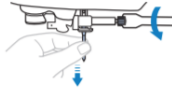
a)

- 3 Press .  
 → The screen changes, and all keys and operation buttons are locked (except ).

**CAUTION**

- When replacing the needle, be sure to press  on the operation panel to lock all keys and buttons, otherwise injuries may occur if the “Start/Stop” button or any other button is pressed and the machine starts.

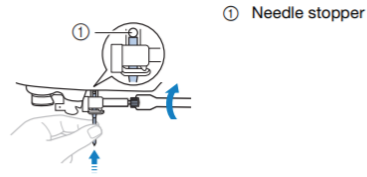
- 4 Hold the needle with your left hand, and then use a screwdriver to turn the needle clamp screw toward you (counterclockwise) to remove the needle.



- Do not apply a strong force when loosening or tightening the needle clamp screw, otherwise certain parts of the machine may be damaged.


b)

- 5 With the flat side of the needle toward the rear of the machine, insert the new needle until it touches the needle stopper. Using the screwdriver tighten the needle clamp screw by turning it clockwise.



**CAUTION**

- Be sure to insert the needle until it touches the needle stopper and securely tighten the needle clamp screw with the screwdriver, otherwise the needle may break or damage may result.

- 6 Press  to unlock all keys and buttons.

c)

Fig. 33

- c. Continue Embroidering from the last stitch

After the needle is replaced and the fabric is back in position, the machine will ask if you want to resume the last design. Select “OK” to get to the screen below and use the needle stitch button to start from the stitch number recorded in Step a. from above.

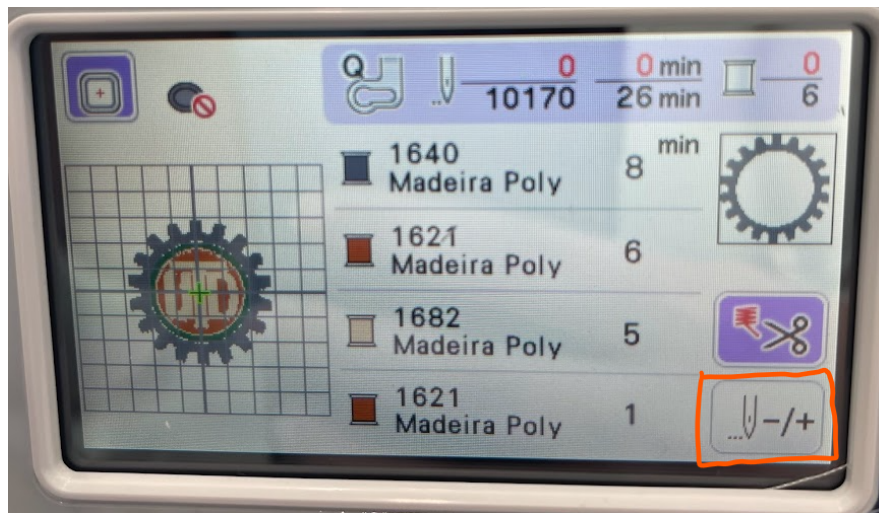


Fig. 34