Whale
Foot Eyes Mouth

A. Foot.

Step 1. Open your **WHALE** part file.

Step 2. Click Insert Menu > Reference Geometry > Center of Mass.
If COM icon is not visible, click View Menu > Hide/Show > Center of Mass.

Step 3. **Right click** the **Center of Mass** in the graphics area and click **Center of Mass Reference Point** on the context toolbar, **Fig. 1**.

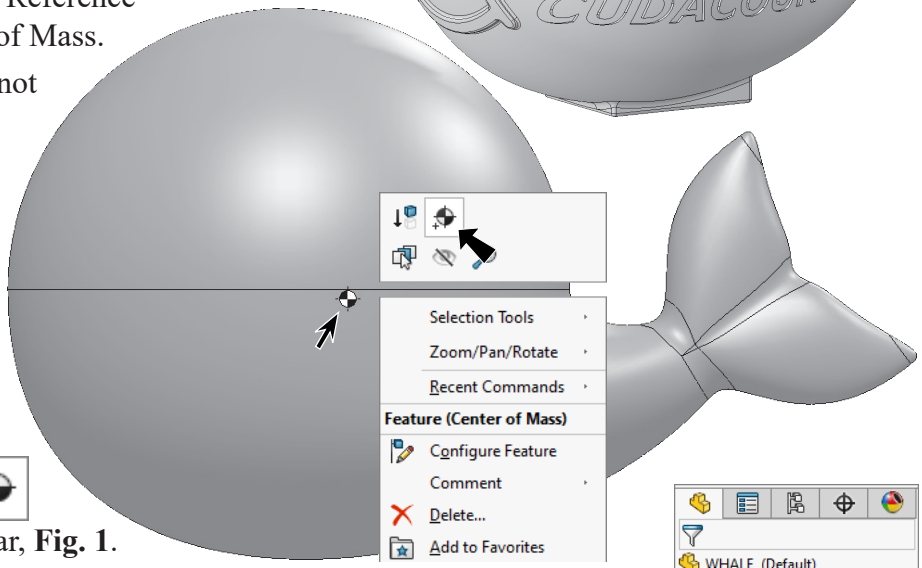

Fig. 1

Step 4. **Hide LID** body. To hide, move cursor over the LID body press **Tab**.

Step 5. Click **Top Plane** in the Feature Manager and click **Sketch** on the context toolbar, **Fig. 2**.

Step 6. Click **Normal To** on the Standard Views toolbar. (**Ctrl-8**)

Step 7. Click Tools Menu > Evaluate > Measure (**M**).

Step 8. In the Measure dialog box set:
select **Show XYZ Measurement**
confirm units **mm**
to confirm, click
Units/Precision **Fig. 3**

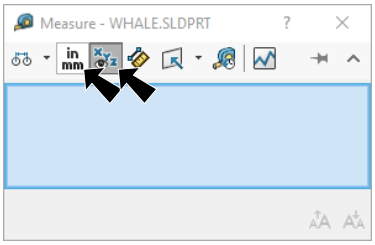

Fig. 3

Step 9. In the Units/Precision dialog box set:
under Length unit, **Fig. 4**
Millimeters
click OK.

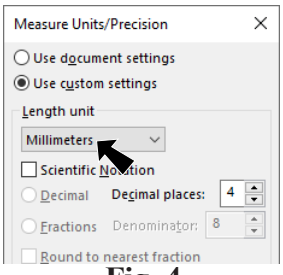

Fig. 4

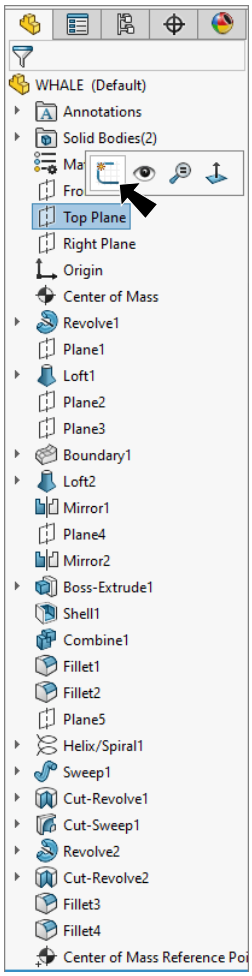

Fig. 2

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Step 10. Back in the Measure dialog box set:

in the graphics area click the **COM point** and **Origin**, **Fig. 6**
note the **dZ Distance** (5.9)
click Close.

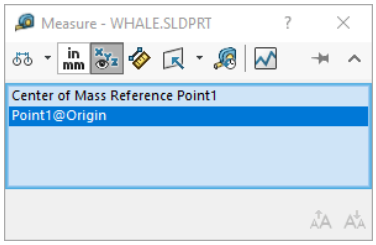


Fig. 5

Step 11. Click **Center Rectangle** in the **Rectangle flyout** on the Sketch toolbar.

Step 12. Sketch a **rectangle away from Origin**, **Fig. 7**.

Step 13. **Right click graphics area and click Select** from menu to unselect Rectangle tool.

Step 14. **Ctrl click center point of rectangle** and **Origin** to select both. Release Ctrl key and click **Make Vertical** on the context toolbar, **Fig. 8**.

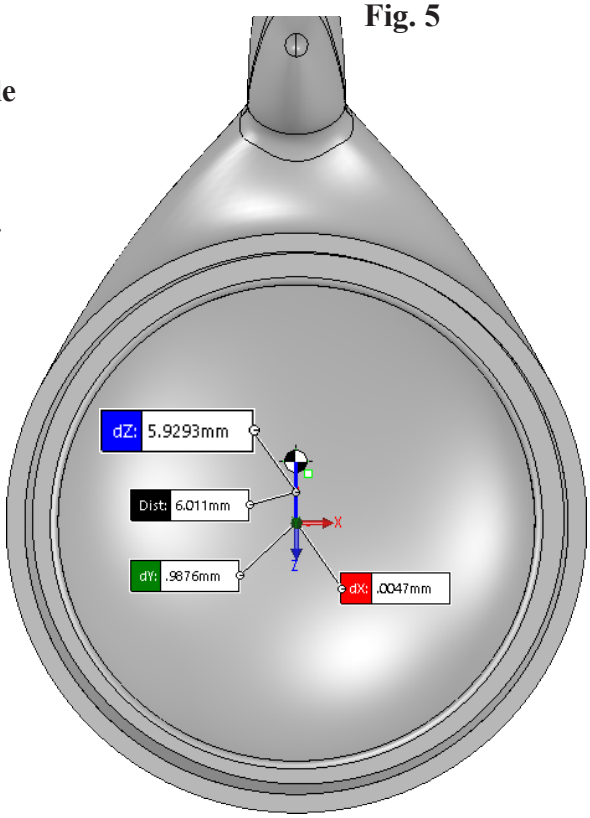


Fig. 6

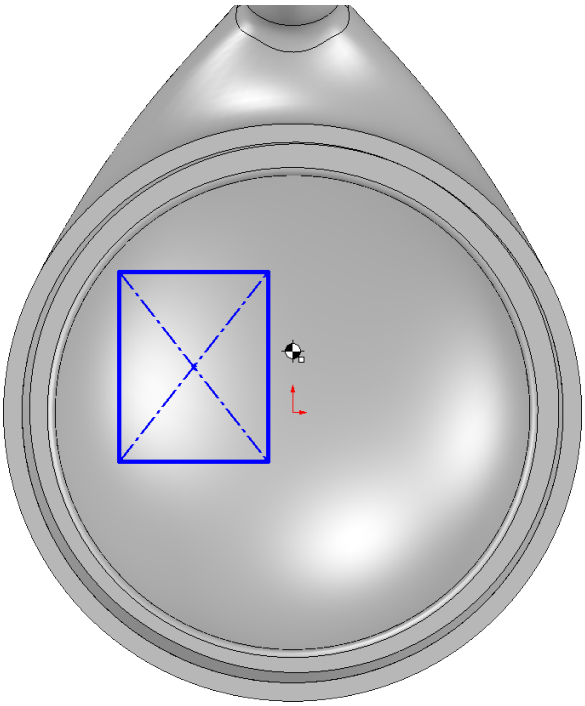


Fig. 7

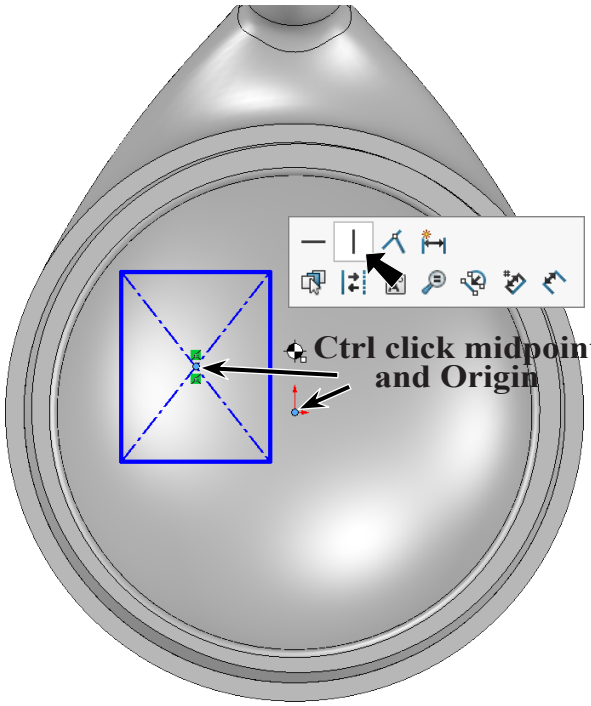


Fig. 8

Step 15. Click **Smart Dimension**

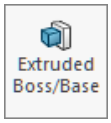
(**S**) on the Sketch toolbar.

Step 16. Add dimensions, **Fig. 9**.

Step 17. Click **Right** on the Standard Views toolbar. (**Ctrl-4**)

Step 18. Click **Features**

on the Command Manager toolbar.

Step 19. Click **Extruded Boss/Base** 

on the Features toolbar.

Step 20. In the Extrude Property Manager set:
under From, **Fig. 10**
Start Condition **Offset**
Reverse Direction
Offset Value 27.5
under Direction 1
Up to Surface
in Face/Plane box
click **BASE side face**, **Fig. 11**
check **Merge results**
click OK .

Step 21. Save. Use **Ctrl-S**.

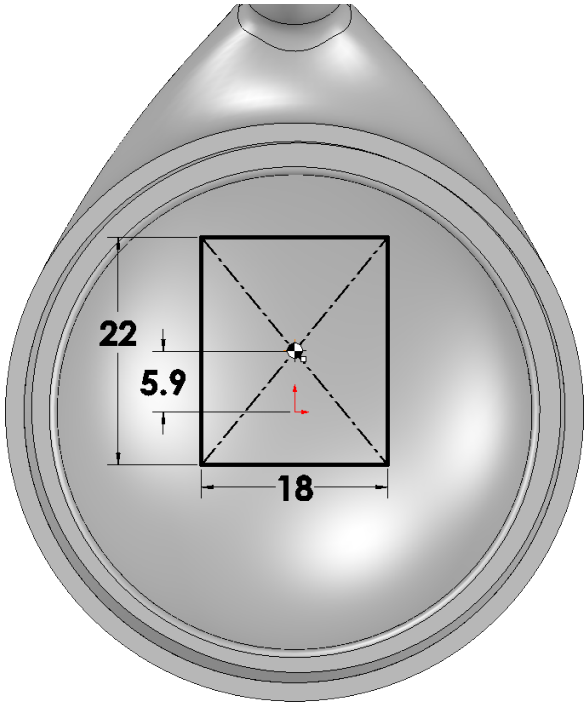


Fig. 9

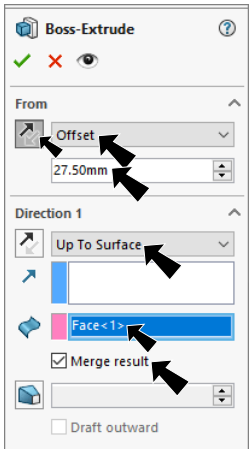


Fig. 10

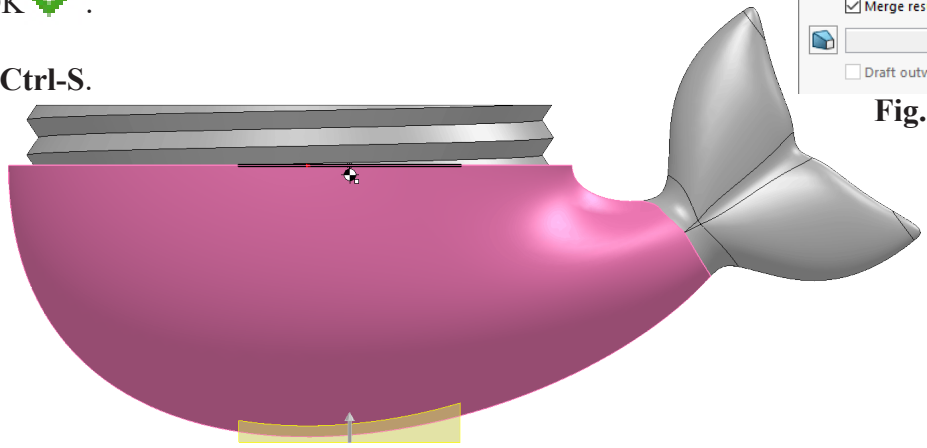


Fig. 11

B. Fillets Foot.

Step 1. Rotate view to view **slightly to view bottom of foot**, hold down middle mouse button (wheel) and drag to rotate view, **Fig. 13**.

Step 2. Click **Fillet**

on the Features toolbar.

Step 3. In the Fillet Property Manager set:
select **FilletXpert**, **Fig. 12**

Radius .5
click an **edge on bottom of foot**, **Fig. 13**

click **Internal to feature** **7 edges** on the Fillet pop-up
click **Apply**

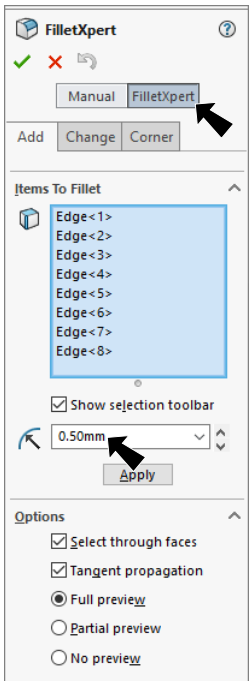


Fig. 12

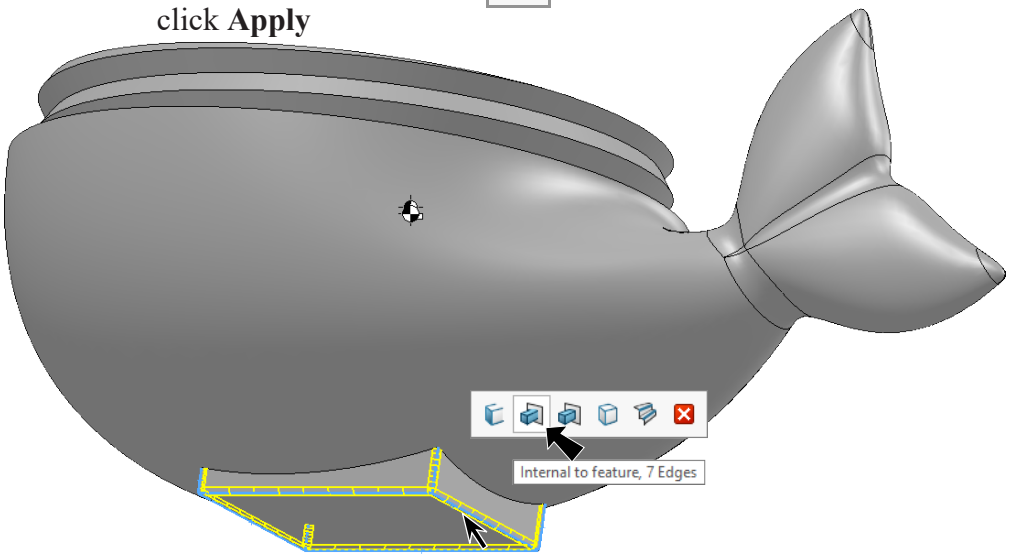


Fig. 13

Radius 1, **Fig. 14**
click **edge at Base and Foot**, **Fig. 15**

click **Right loop** **7 edges** on the Fillet pop-up toolbar
click OK .

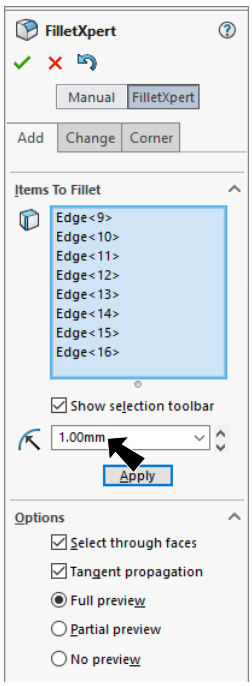


Fig. 14

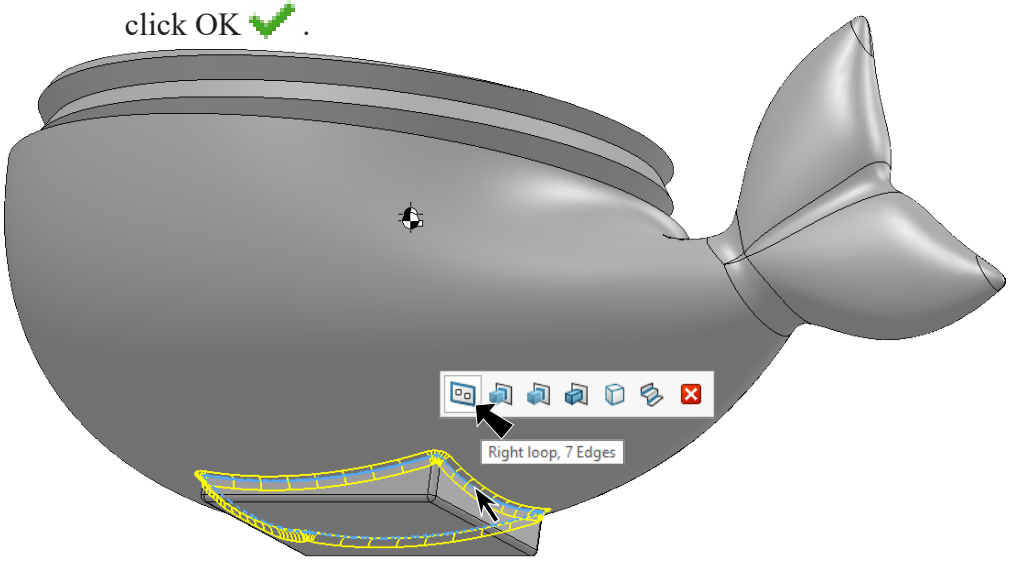


Fig. 15

Step 4. Save. Use **Ctrl-S**.

C. Eyes and Mouth Construction Lines

Step 1. **Hide both Center of Mass** and **Center of Mass Reference Point** in the Feature Manager, **Fig. 16**.

Step 2. Click **Front Plane** in the Feature Manager and click **Sketch** on the context toolbar, **Fig. 17**.

Step 3. Click **Normal To** on the Standard Views toolbar. **(Ctrl-8)**

Step 4. **Hide BASE** body. To hide, move cursor over the BASE press **Tab**.

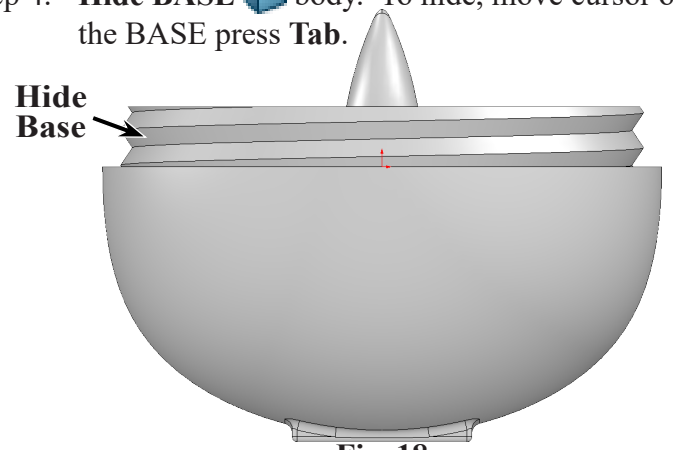


Fig. 18

Step 5. Click **Centerline** in the **Line flyout** on the Sketch toolbar.

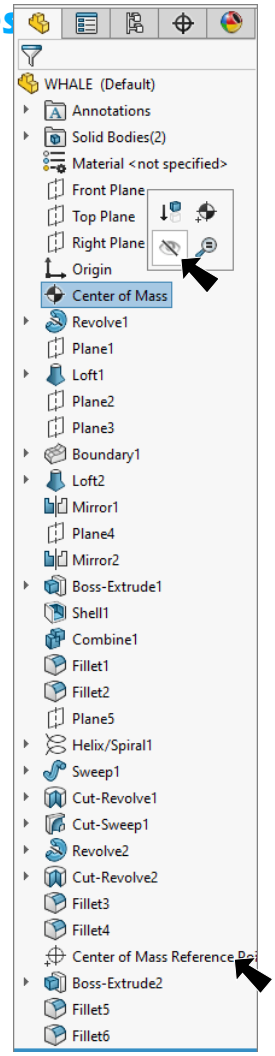


Fig. 16

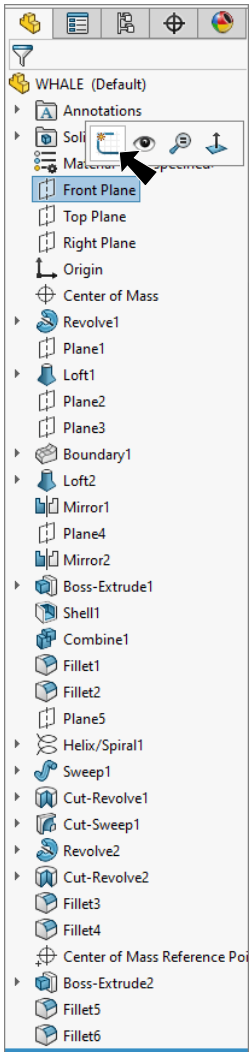


Fig. 17

Step 6. Starting from **Origin** sketch a vertical centerline down and the other construction lines, **Fig. 19**. Double click to terminate chain of lines.

Step 7. Click **Smart Dimension** (**S**) on the Sketch toolbar.

Step 8. Add dimensions, **Fig. 20**.

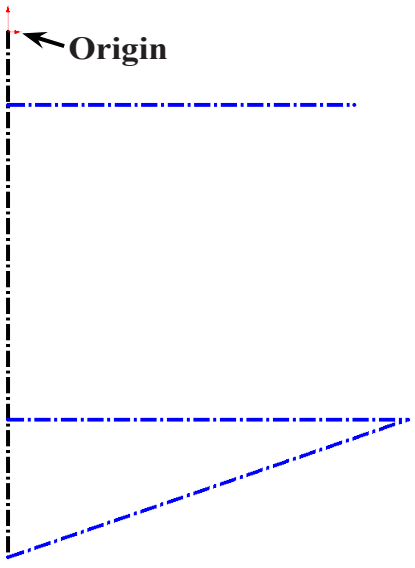


Fig. 19

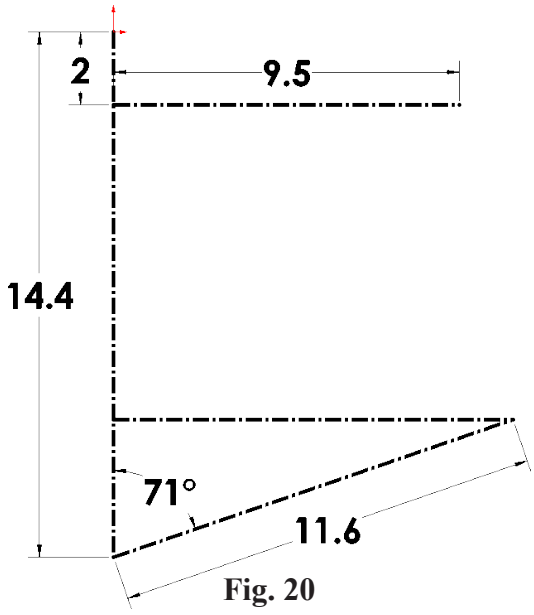


Fig. 20

D. Eyes and Mouth Slots.

Step 1. Click **3 Point Arc Slot** (**S**) in the **Straight Slot flyout** on the Sketch toolbar.

Step 2. Sketch a 3 point arc slot starting from the right endpoint of top horizontal construction line, **Fig. 21**. To sketch arc, click right endpoint of horizontal line for start point of arc. Move cursor to right for ending point of arc and then click. Move cursor down for third point of arc and click. Move cursor out for width of slot and click.

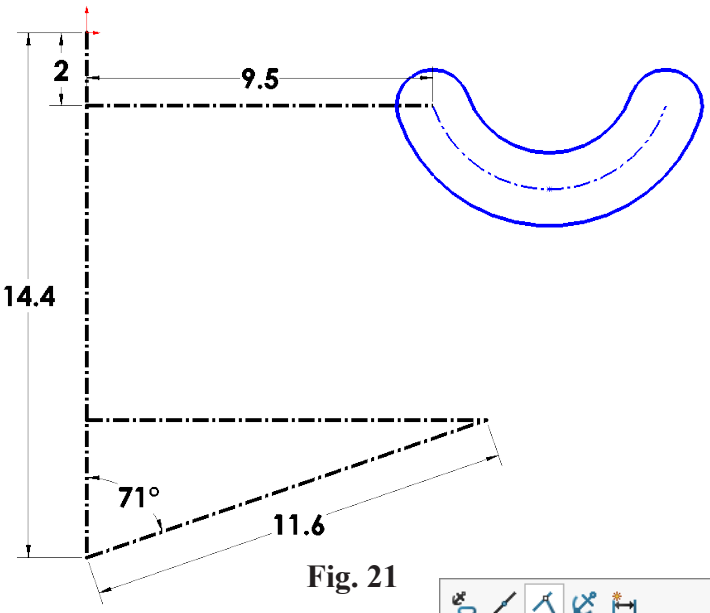


Fig. 21

Step 3. **Right click graphics area and click Select** from menu to unselect Slot tool.

Step 4. **Ctrl click top horizontal construction line and right endpoint of slot centerline** to select both. Release Ctrl key and click **Make Coincident** on the context toolbar, **Fig. 22**.

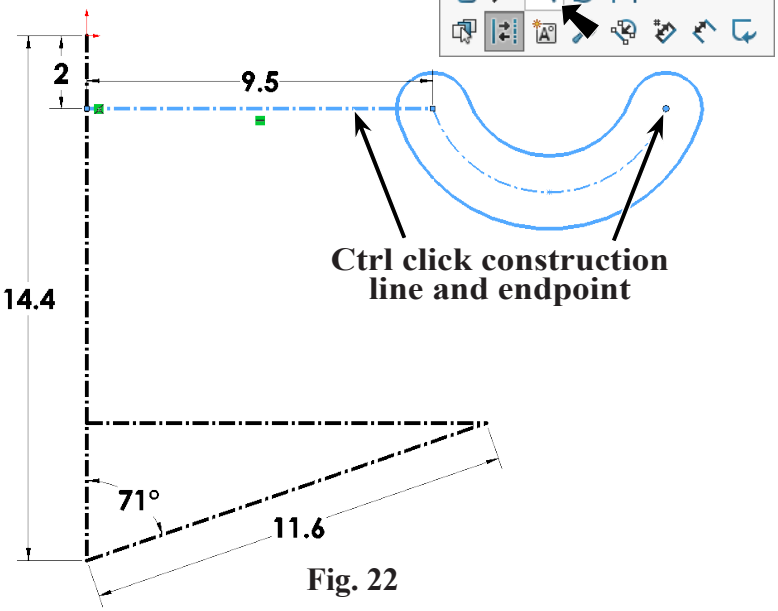


Fig. 22

Step 5. Click **Smart Dimension** (**S**) on the Sketch toolbar.

Step 6. Add dimensions, **Fig. 23**.

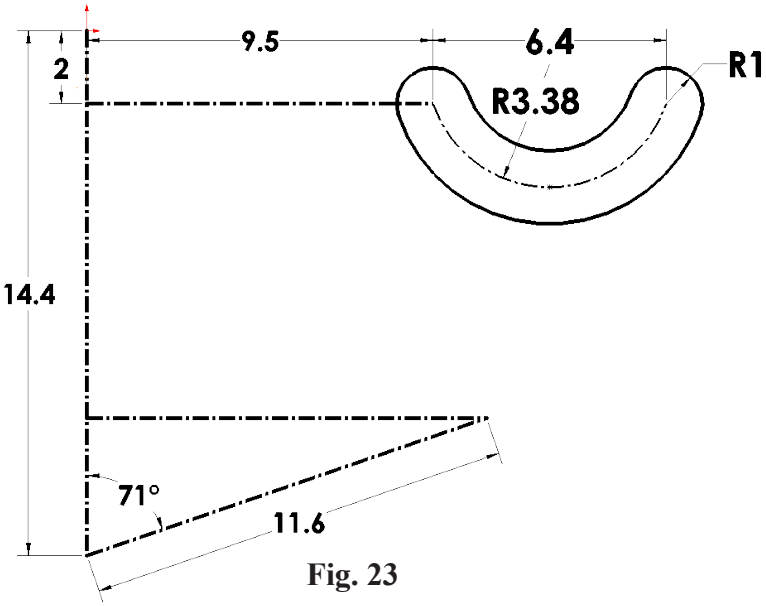


Fig. 23

Step 7. Click **3 Point Arc Slot** **(S)** on the Sketch toolbar.

Step 8. Sketch a **3 point arc slot starting from right endpoint of bottom horizontal construction and across to left side of vertical centerline**, **Fig. 24**.

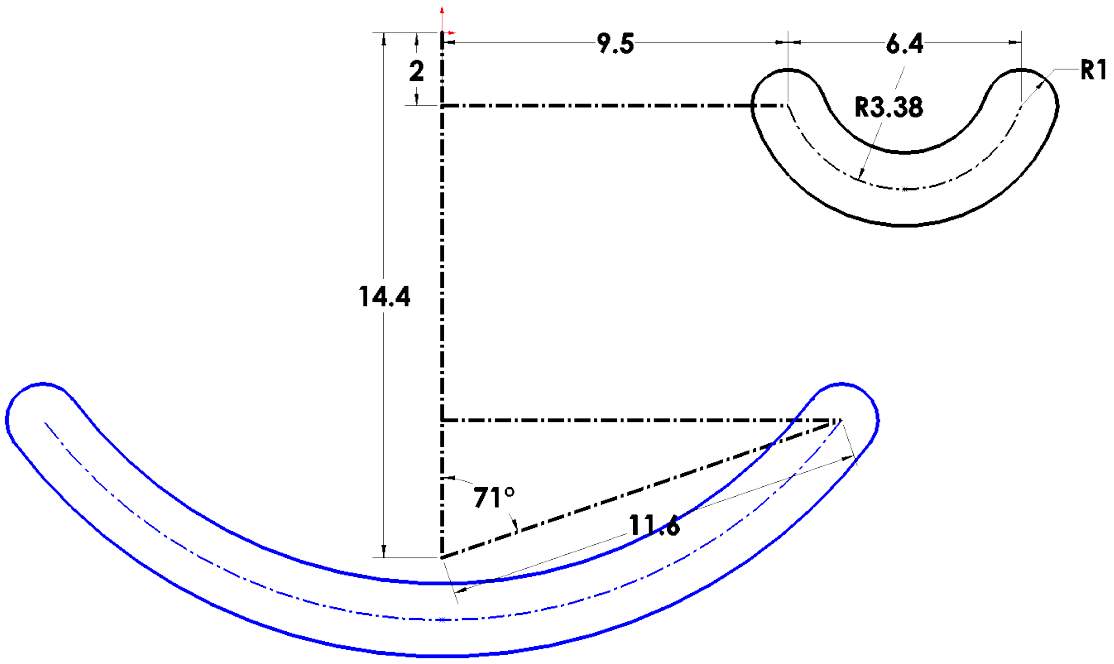


Fig. 24

Step 9. **Right click graphics area and click Select** from menu to unselect Slot tool.

Step 10. **Ctrl click bottom horizontal construction and left endpoint of slot centerline** to select both. Release Ctrl key and click **Make Coincident** on the context toolbar, **Fig. 25**.

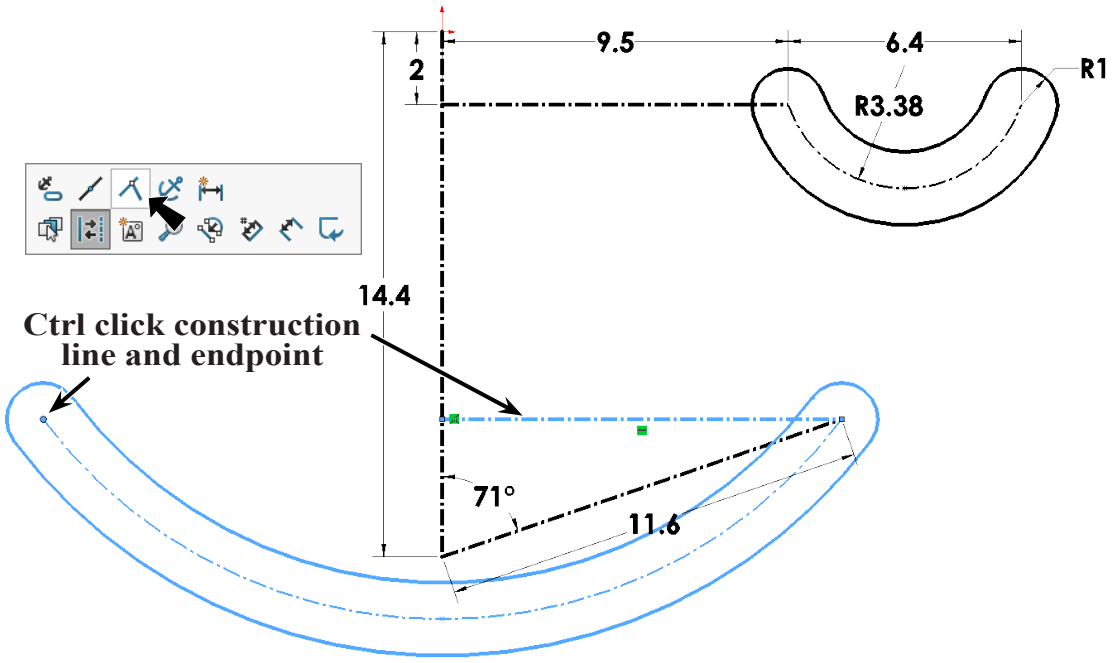


Fig. 25

Step 11. **Ctrl click small arc in eye slot and small are in mouth slot** to select both. Release Ctrl key and click **Make Equal** on the context toolbar, **Fig. 26**.

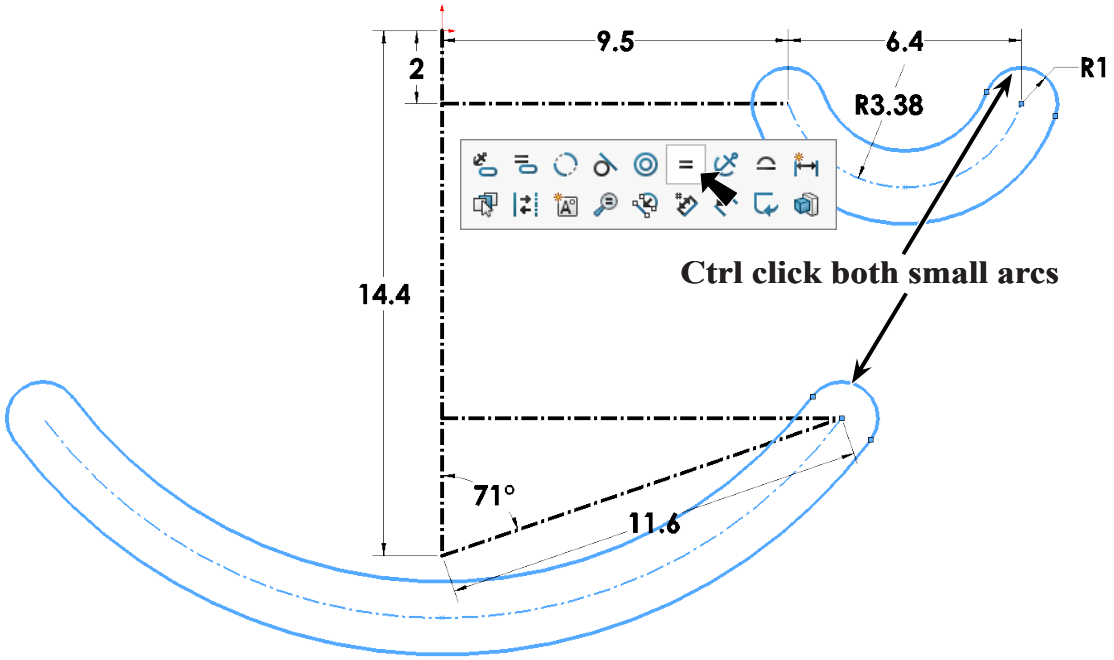


Fig. 26

Step 12. **Ctrl click bottom endpoint vertical centerline and midpoint of centerline in mouth slot** to select both. Release Ctrl key and click **Make Coincident** on the context toolbar, **Fig. 27**.

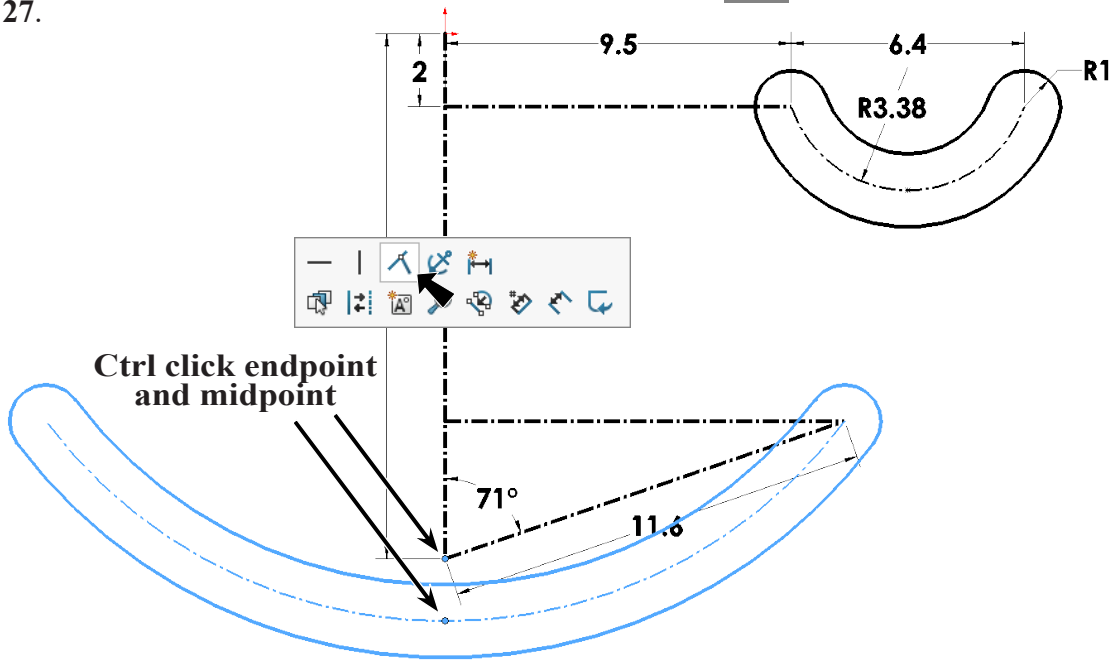


Fig. 27

Step 13. Click **Straight Slot** (**S**) in the **Slot flyout** on the Sketch toolbar.

Step 14. Sketch a **straight slot at angle just off of mouth slot**, **Fig. 28**.

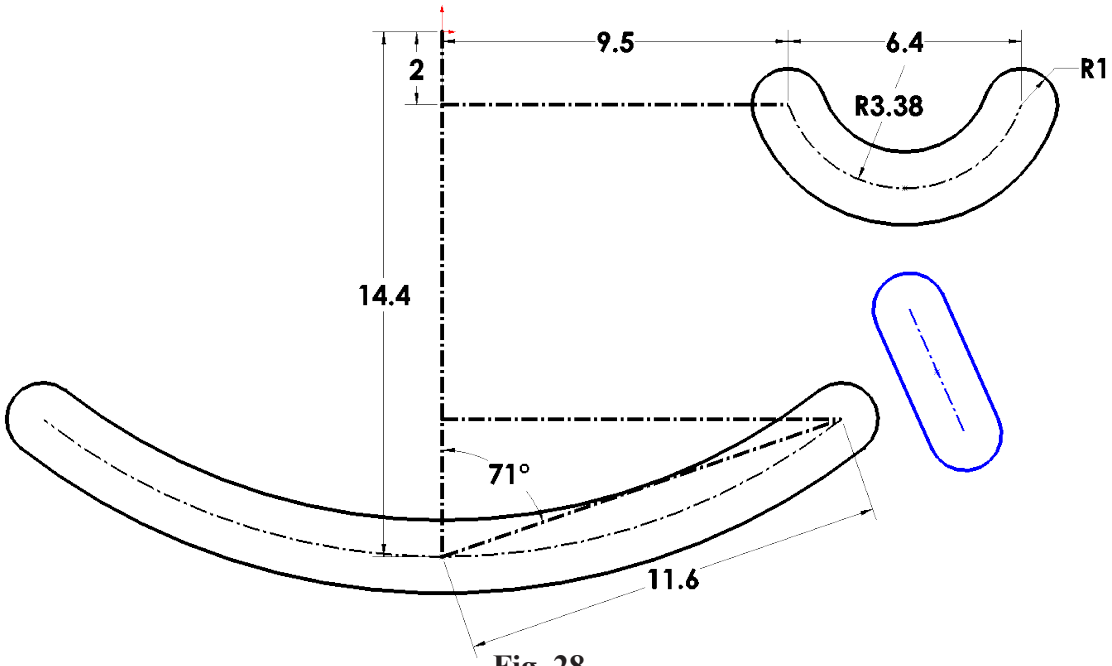


Fig. 28

Step 15. **Right click graphics area and click Select** from menu to unselect Slot tool.

Step 16. **Ctrl click midpoint point of straight slot and right endpoint of mouth slot centerline** to select both. Release Ctrl key and click **Make Coincident** on context toolbar, **Fig. 29**.

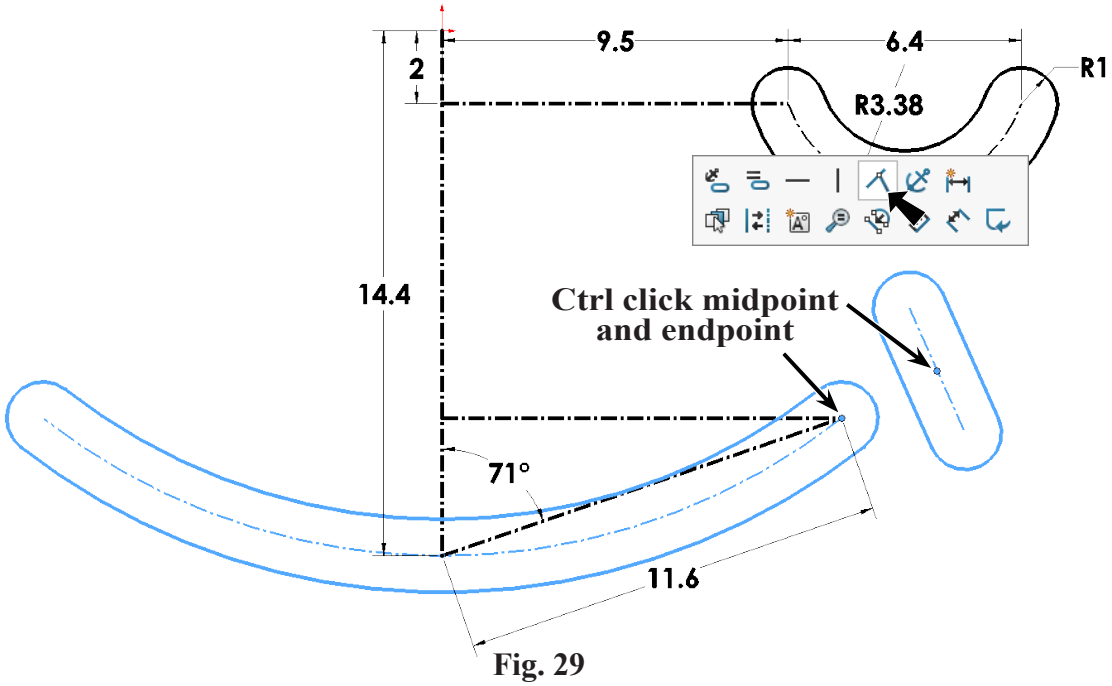


Fig. 29

Step 17. **Ctrl click small arc of straight slot and small are of eye slot** to select both. Release Ctrl key and click **Make Equal** on the context toolbar, **Fig. 30**.

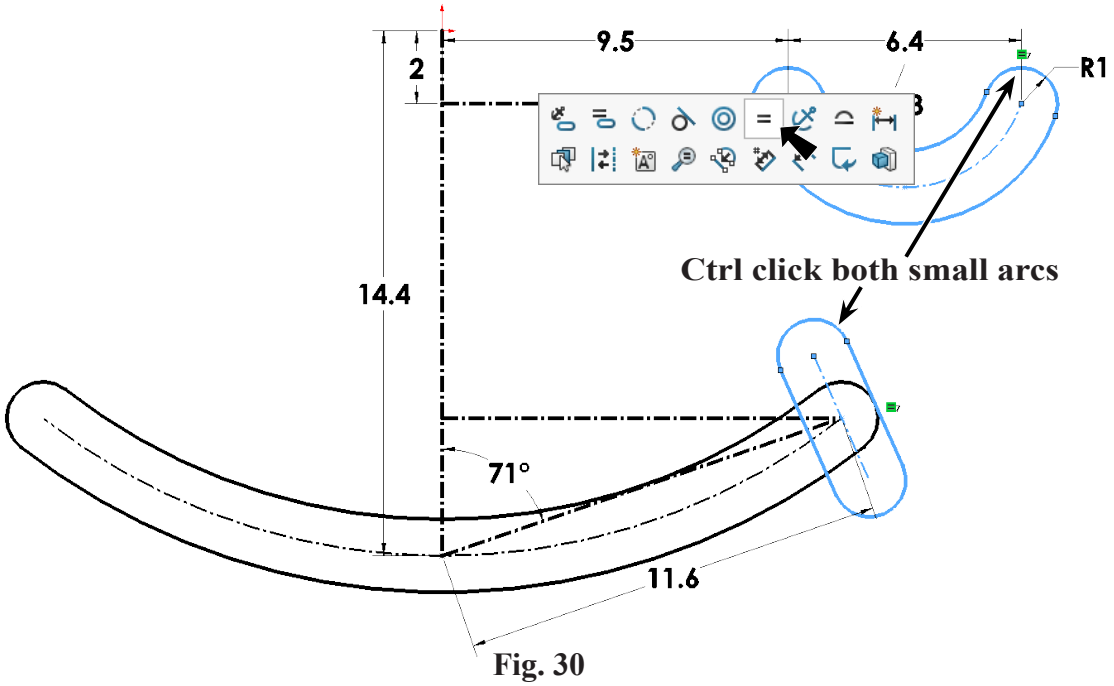


Fig. 30

Step 18. Click **Smart Dimension** (**S**) on the Sketch toolbar.

Step 19. Add dimensions **3.75** and **66°**, **Fig. 31**.

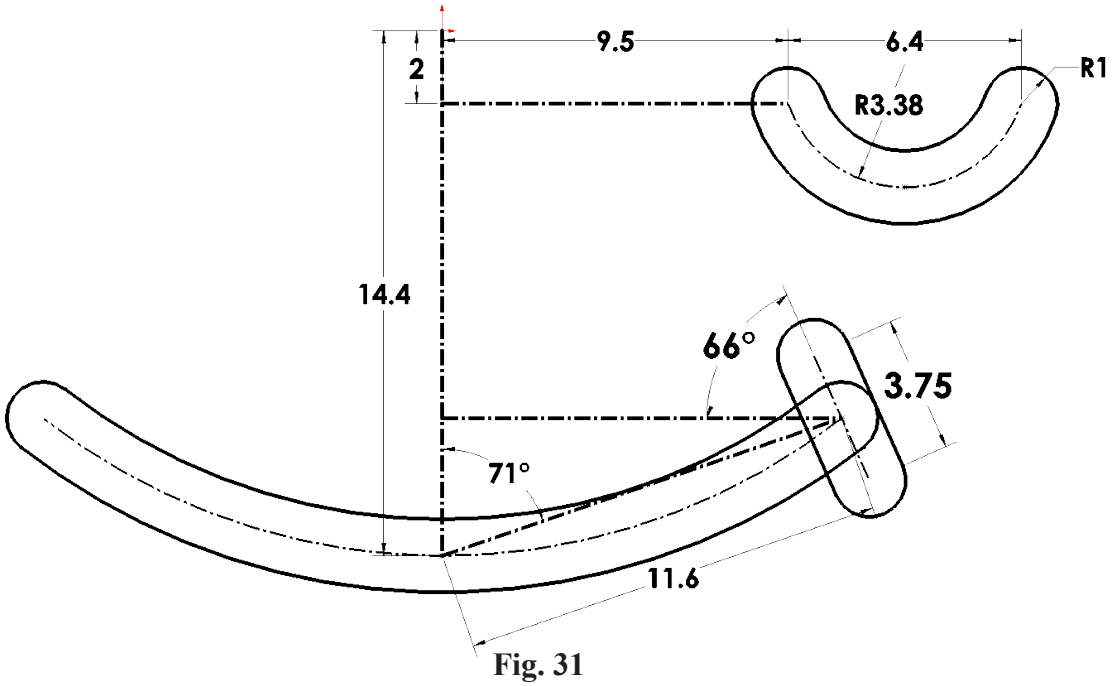


Fig. 31

Step 20. **Right click graphics area and click Select** from menu to unselect Smart Dimension.

Step 21. **Ctrl click both small slots and vertical centerline line**, **Fig. 32**.

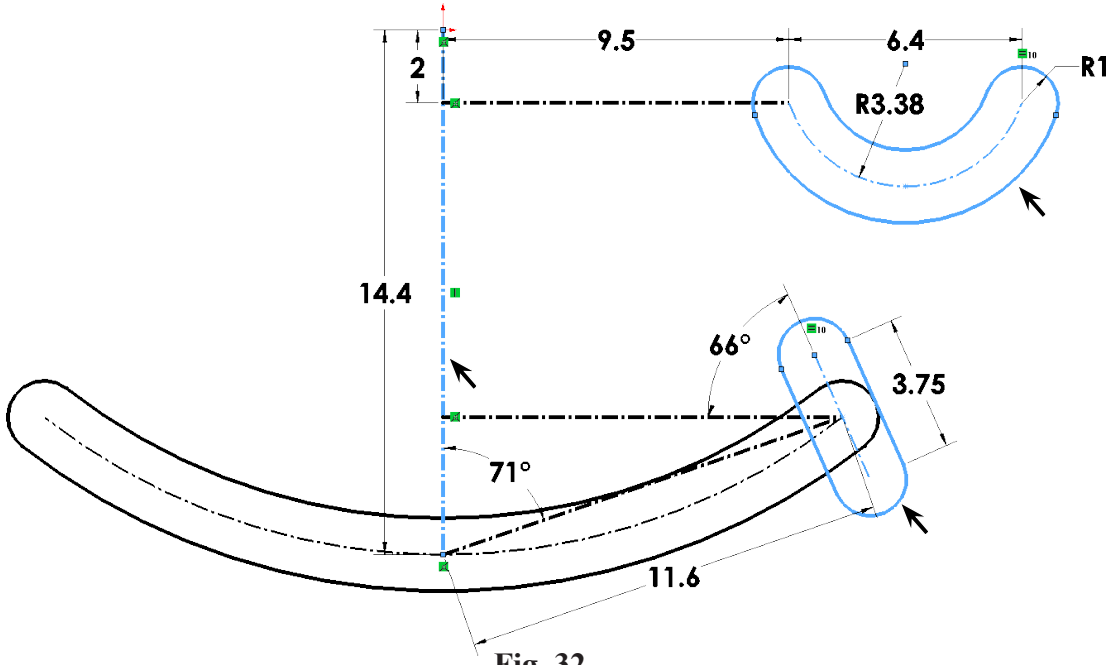


Fig. 32

Step 22. Click **Mirror Entities** on the Sketch toolbar, **Fig. 33**.

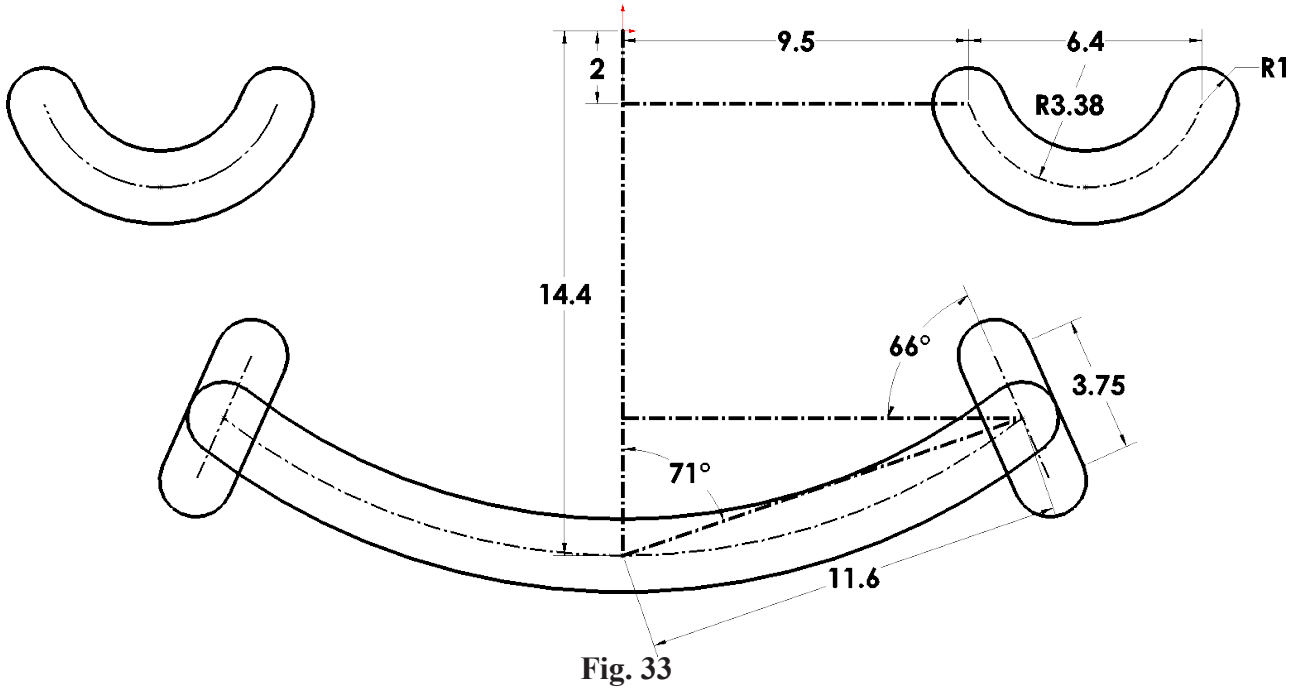


Fig. 33

Step 23. **Show BASE** body. To show, move cursor over the BASE body area and press **Shift-Tab**.

Step 24. Rotate view to view **slightly to view eyes and mouth**, hold down middle mouse button (wheel) and drag to rotate view, **Fig. 35**.

Step 25. Click **Features** Features on the Command Manager toolbar.

Step 26. Click **Extruded Boss/Base** Extruded Boss/Base on the Features toolbar.

Step 27. In the Extrude Property Manager set:

under From, **Fig. 34**

Start Condition **Surface/Face/Plane**

in Face/Plane box

click **BASE face**, **Fig. 35**

under Direction 1

Depth D1 **.8**

check **Merge results**

under Selected Contours

click the **5 regions of the slots**.

click OK .

Tip: To select slots, click edge of small slots and click inside mouth slot.

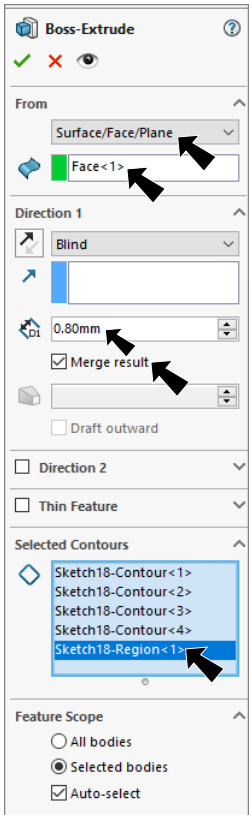


Fig. 34

Step 28. Save. Use **Ctrl-S**.

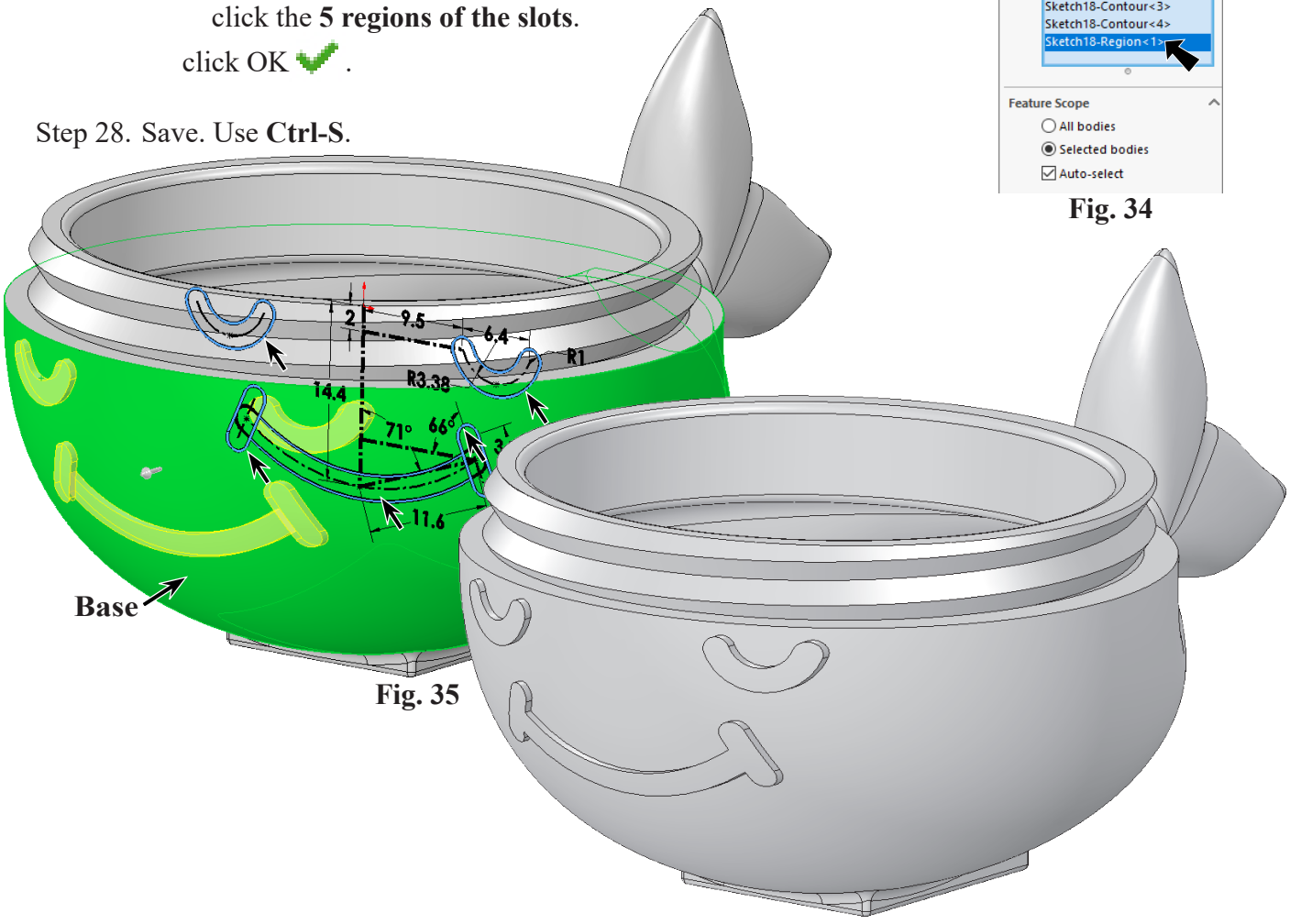


Fig. 35

Fig. 36

E. Fillets Eyes and Mouth.

Step 1. Click **Fillet**

on the Features toolbar.

Step 2. In the Fillet Property Manager set:
select **FilletXpert**, **Fig. 37**

Radius .35
click an **front edge of eye extrude**, **Fig. 38**
click **Internal to feature** **23 edges** on the Fillet pop-up
click **Apply**,

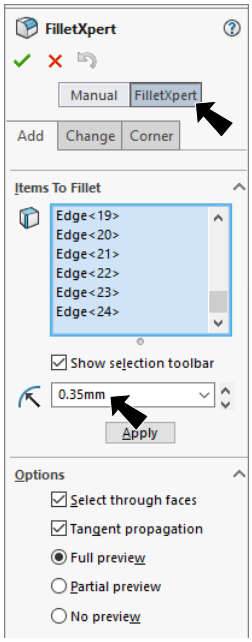


Fig. 37

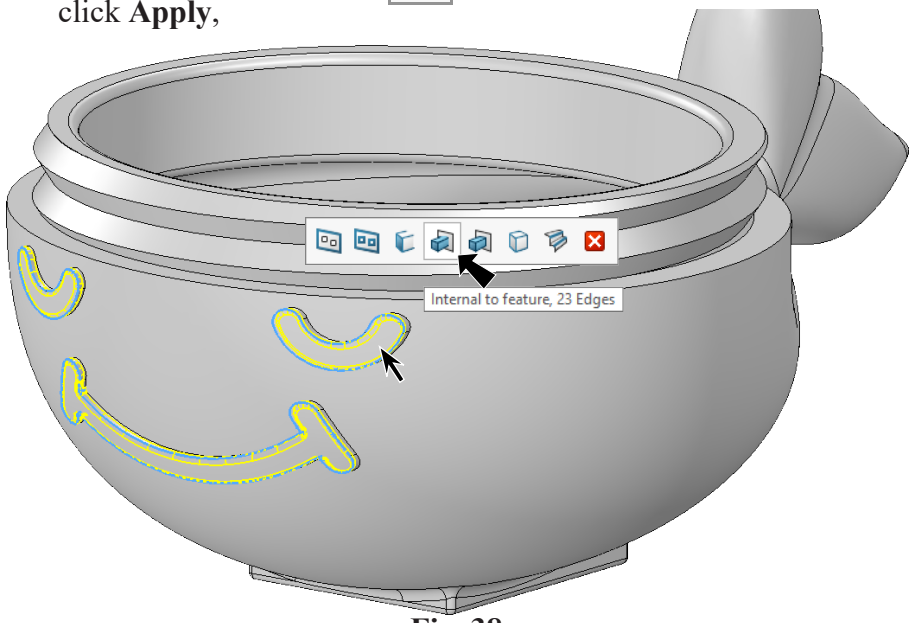


Fig. 38

keep Radius .35
click **rear edge of eye extrude**, **Fig. 40**
click **Between left feature and part** **19 edges** on pop-up
click OK .

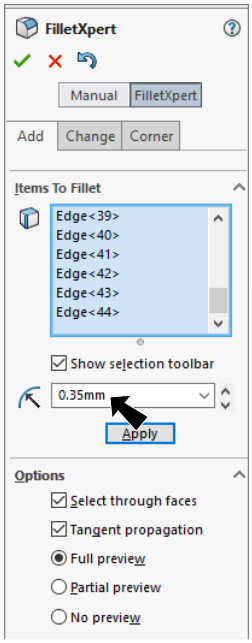


Fig. 39

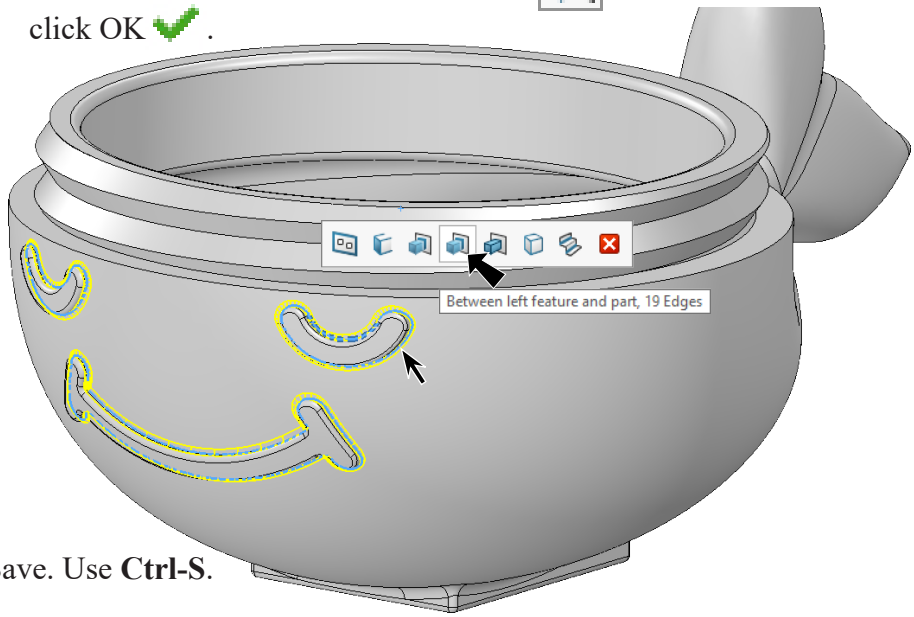


Fig. 40

Step 3. Save. Use **Ctrl-S**.

F. Split Base.

Step 1. Click **Right Plane** in the Feature Manager to select Plane **Fig. 41**.

Step 2. Click Insert Menu > Features > Split.

Step 3. In the Split Property Manager:
under Trim Tools, **Fig. 42**
Right Plane was preselected
under Target bodies
click in the Solids or Surfaces to Split box
click **Base**, **Fig. 43**
click **Cut Bodies**
under Resulting Bodies
check **both check boxes**
click OK .

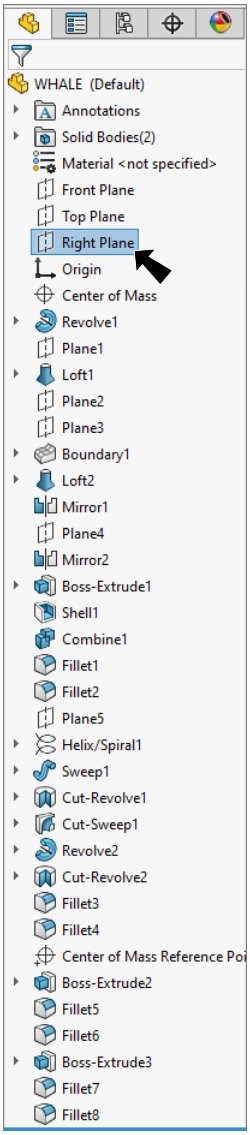


Fig. 41

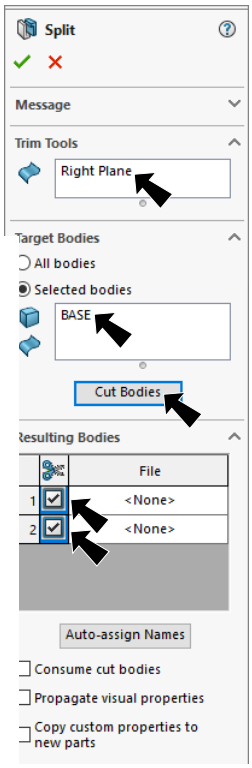


Fig. 42

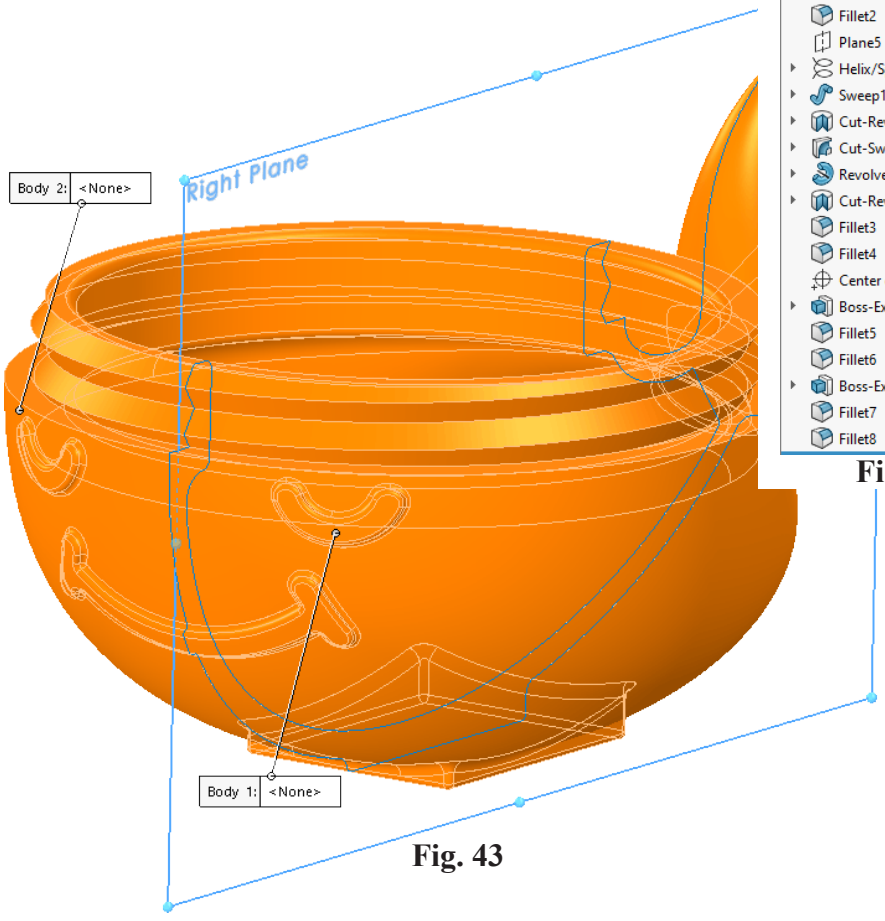


Fig. 43

G. Text Left Side.

Step 1. Click **Right Plane** in the Feature Manager and click **Sketch** on the context toolbar, **Fig. 44**.

Step 2. Click **Normal To** on the Standard Views toolbar. **(Ctrl-8)**

Step 3. Click **Centerline** in the **Line flyout** on the Sketch toolbar.

Step 4. Sketch a **vertical centerline down from Origin** and a **horizontal construction line coincident through bottom endpoint of centerline** **Fig. 45**.

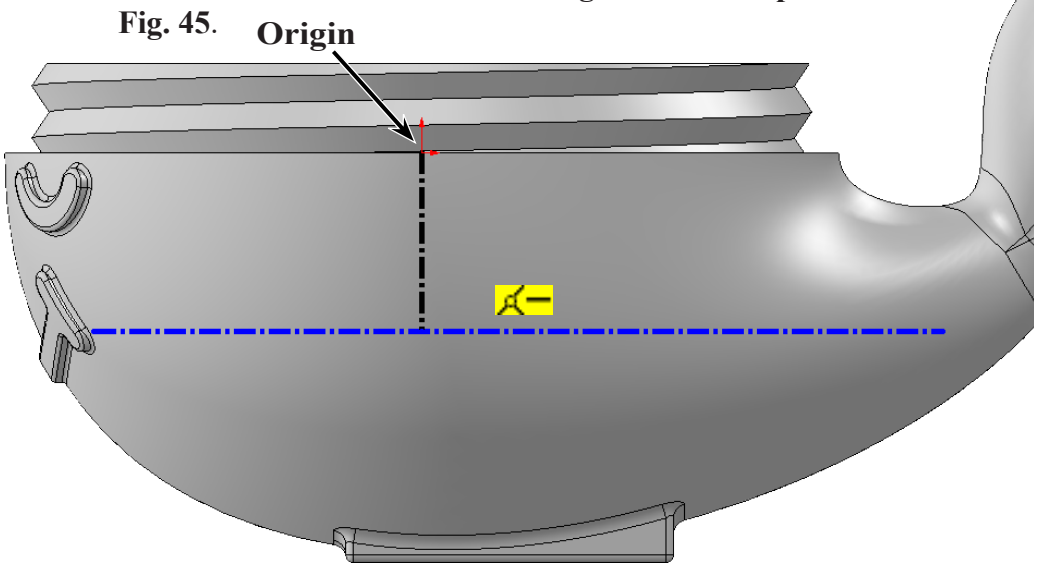


Fig. 45

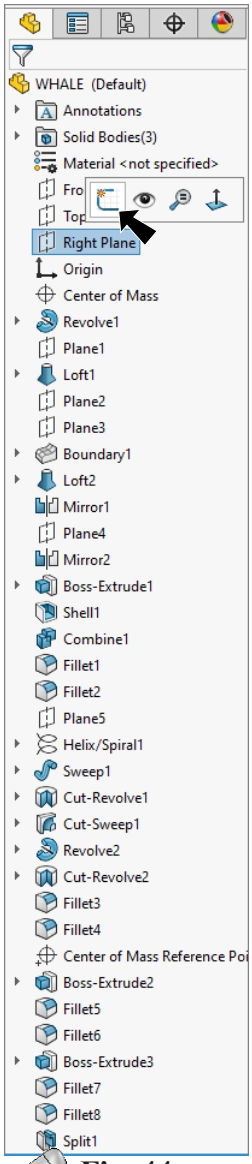


Fig. 44

Step 5. Click **Smart Dimension** **(S)** on the Sketch toolbar.

Step 6. Add dimensions, **Fig. 46**.

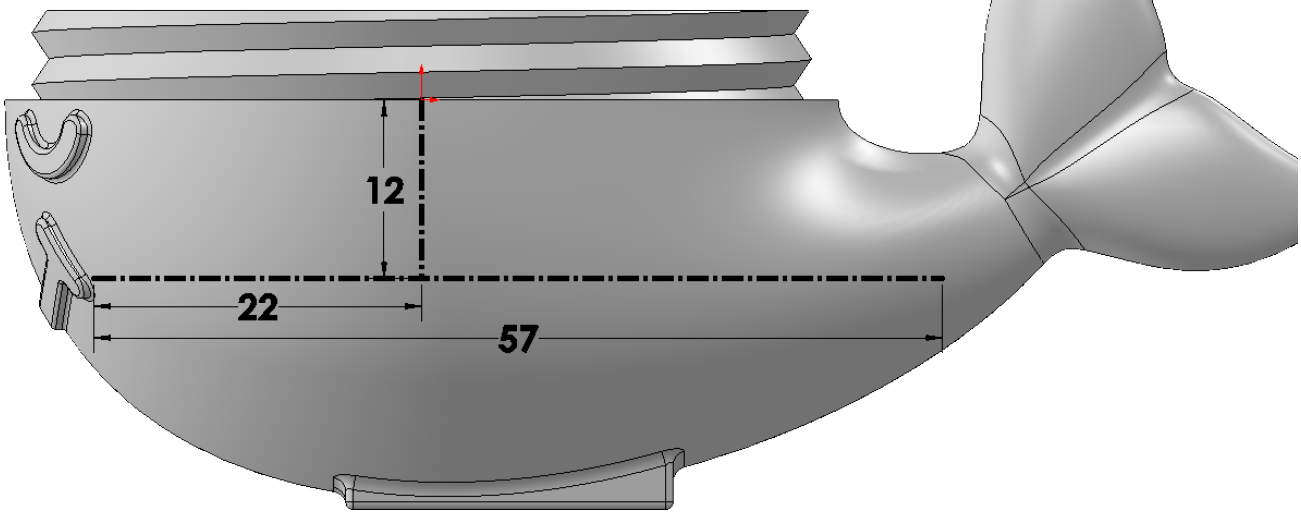


Fig. 46

Step 7. Click **Text Tool** on the Sketch toolbar.

Step 8. In the Sketch Text Property Manager set:
under Curves, **Fig. 47**
click **horizontal construction line**, **Fig. 48**
under Text
click in the box and key-in **CUDACOUNTRY**
Center Align
uncheck **Use document font** checkbox
Width Factor **105**
click **Font** button.

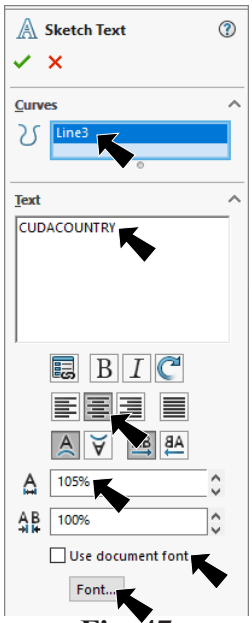


Fig. 47

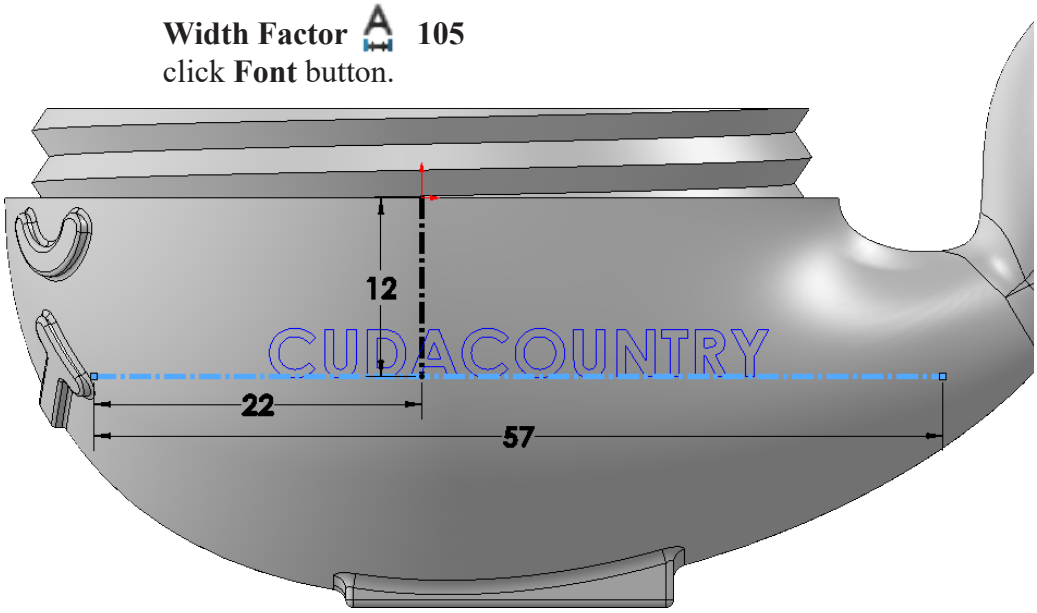


Fig. 48

Step 9. In the Choose Font dialog box select:
under Font, **Fig. 49**
select **Verdana**
under Font Style
Bold Italic
under Height
select **Points 17**
click **OK** button
click OK .

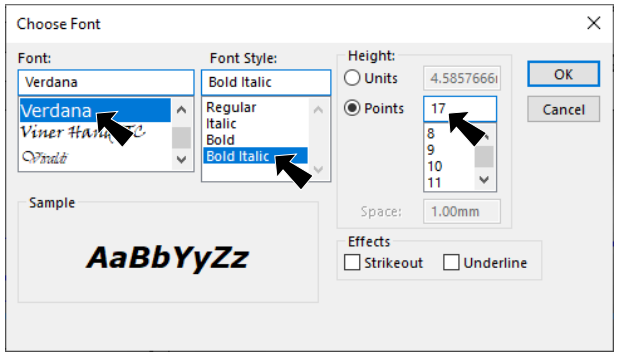


Fig. 49

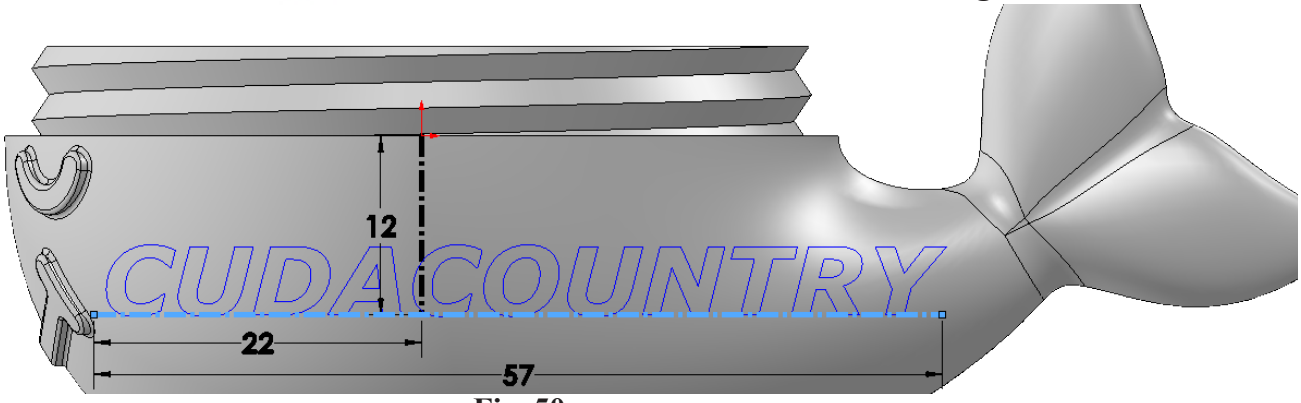


Fig. 50

Step 10. Rotate a little so see the cut, **Fig. 52**.

Step 11. Click **Features** Features on the Command Manager toolbar.

Step 12. Click **Extruded Cut** Extruded Cut on the Features toolbar.

Step 13. In the Cut-Extrude Property Manager set:

under From, **Fig. 51**

Start Condition **Surface/Face/Plane**

in Face/Plane box

click **BASE face**, **Fig. 52**

under Direction 1

Depth D1 **.5**

click OK .

Step 14. Save. Use **Ctrl-S**.

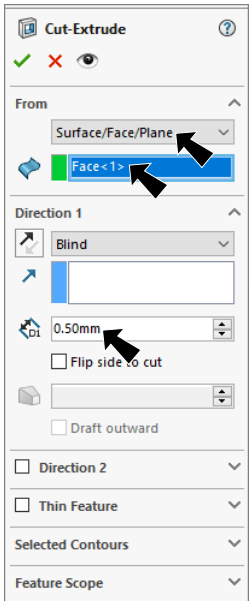


Fig. 51

Fig. 52

Fig. 53

H. Text Right Side.

Step 1. **Copy Sketch19** (Sketch16 if using Thread feature). To copy, expand Cut-Extrude1 in the Feature Manager and click **Sketch19** to select. Use **Ctrl-C** to copy, **Fig. 54**.

Step 2. **Paste Sketch19 into Right Plane**. To paste, click **Right Plane** in the Feature Manager and paste, **Ctrl-V**, **Fig. 55**.

Step 3. Click the **pasted Sketch20** and click **Edit Sketch** on the context toolbar, **Fig. 55**.

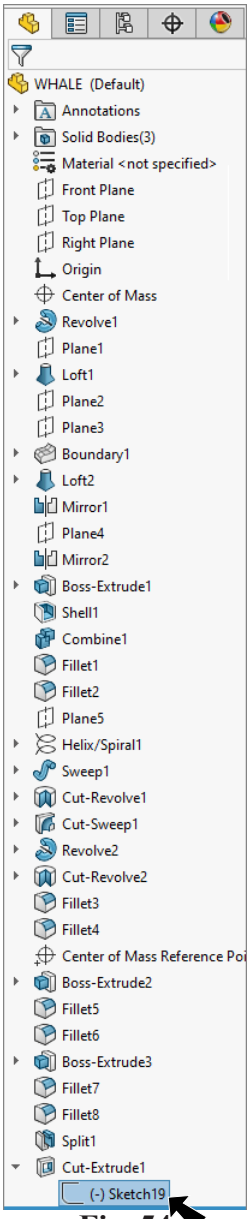


Fig. 54

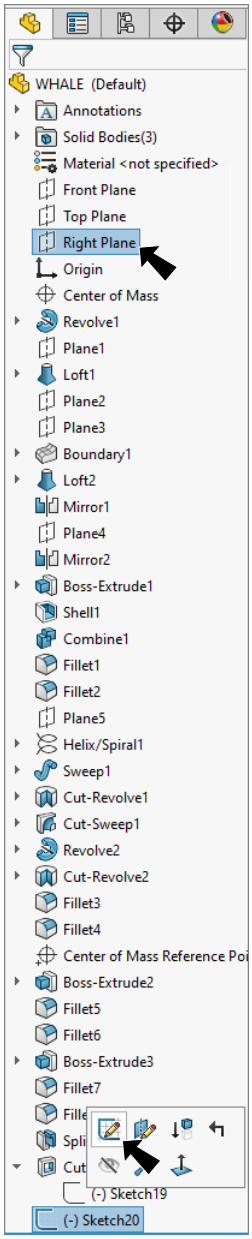


Fig. 55

Step 4. Click **Left** on the Standard Views toolbar. (**Ctrl-3**)

Step 5. **Double click the text** to edit text, **Fig. 56**.

Step 6. In the Sketch Text Property Manager set:
under Text, **Fig. 57**
Flip Horizontal
click OK .

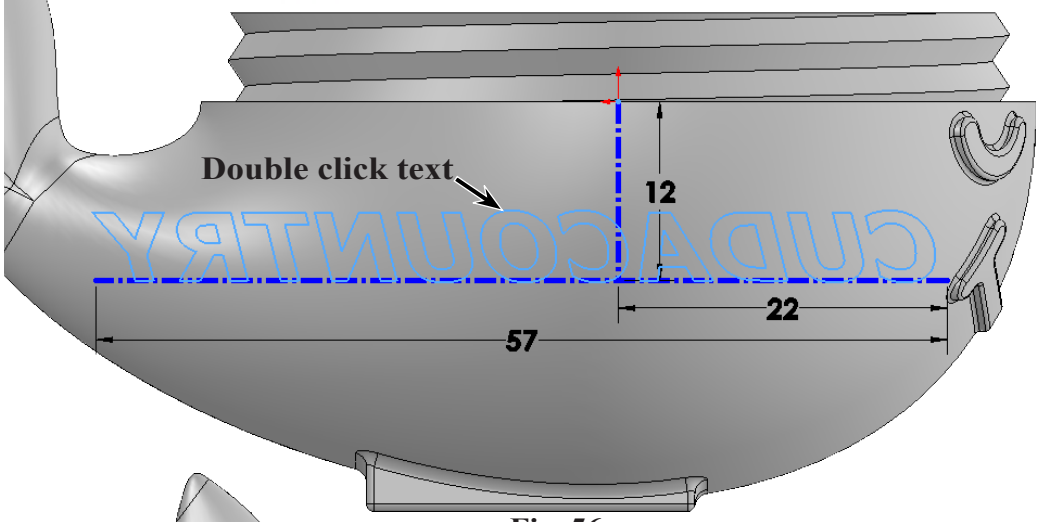


Fig. 56

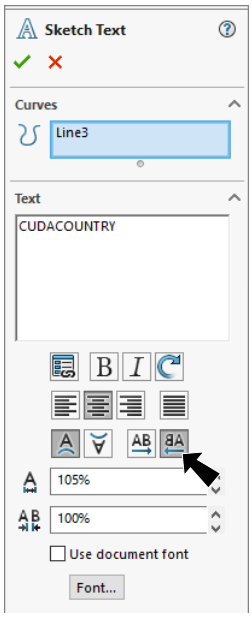


Fig. 57

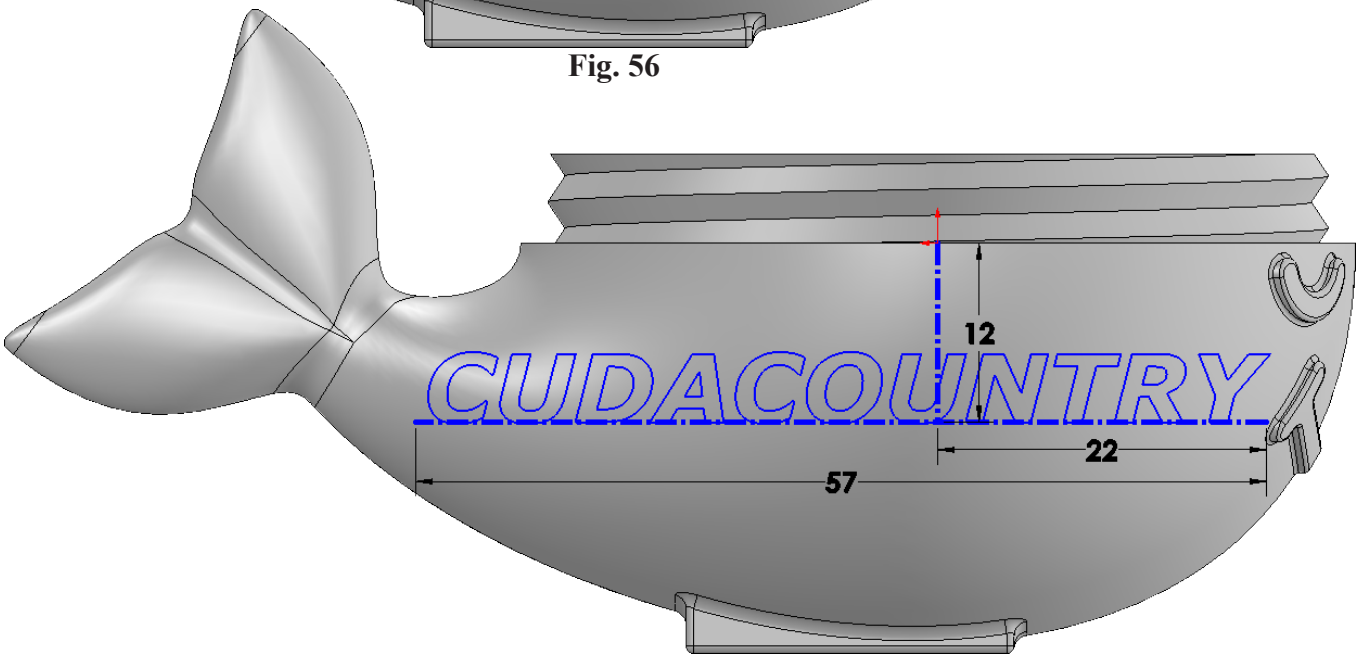


Fig. 58

Step 7. Rotate a little so see the cut, **Fig. 60**.

Step 8. Click **Features** Features on the Command Manager toolbar.

Step 9. Click **Extruded Cut** Extruded Cut on the Features toolbar.

Step 10. In the Cut-Extrude Property Manager set:

under From, **Fig. 59**

Start Condition **Surface/Face/Plane**

in Face/Plane box

click **BASE face**, **Fig. 60**

under Direction 1

click **Reverse Direction** **Direction arrow should point back into body**

Depth **.5**

click OK .

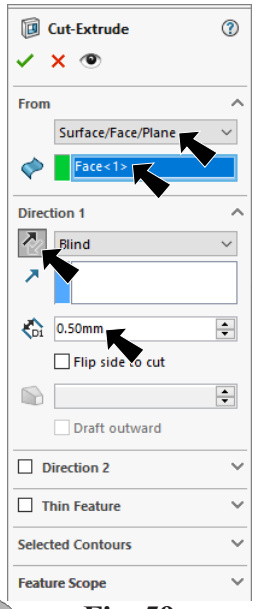


Fig. 59

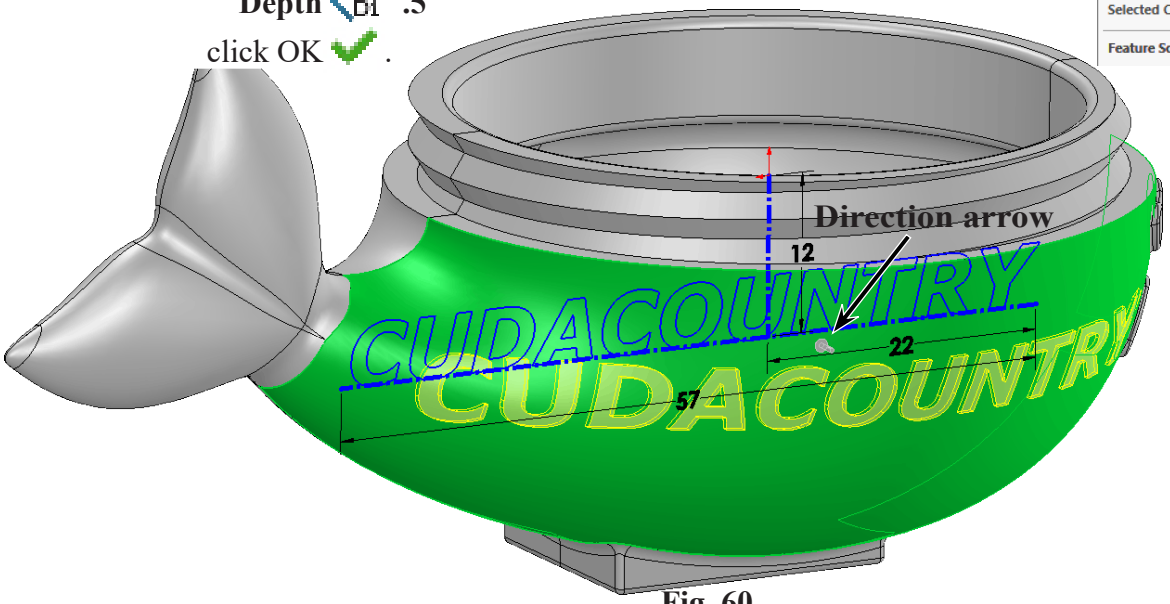


Fig. 60

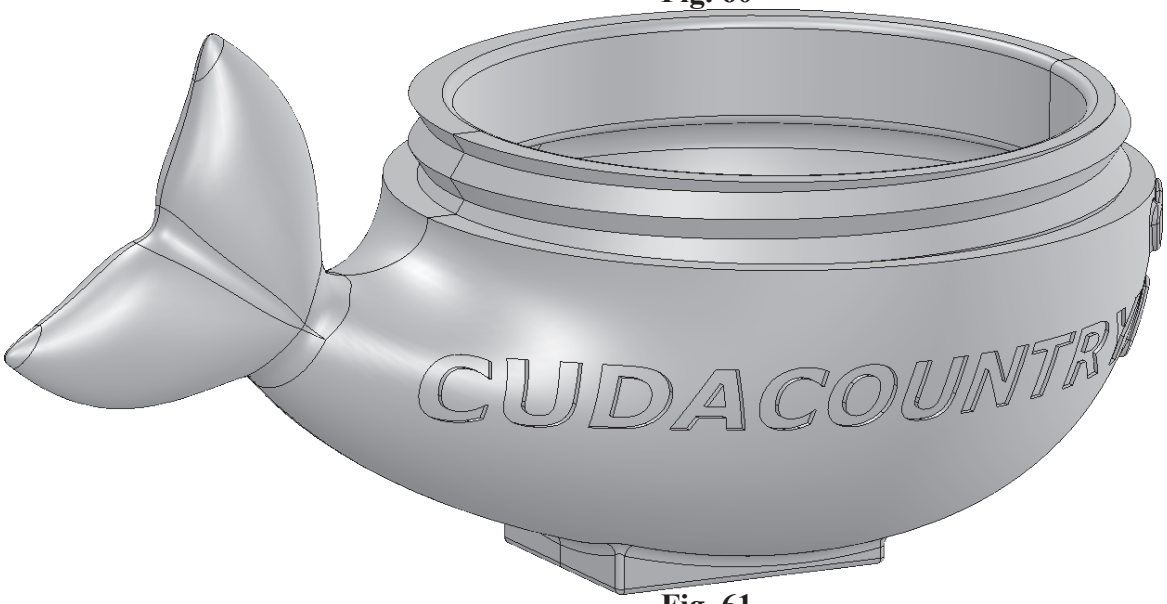


Fig. 61

I. Combine.

Step 1. Click Insert Menu > Features > Combine.

Step 2. In the Combine Property Manager:
under Operation Type, **Fig. 62**
select **Add**
click **both Base bodies**, **Fig. 63**
click OK ✔ .

Step 3. Save. Use **Ctrl-S**.

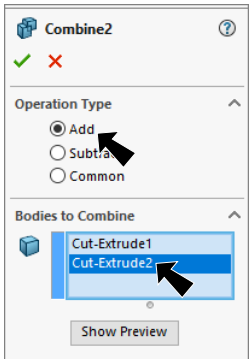


Fig. 62

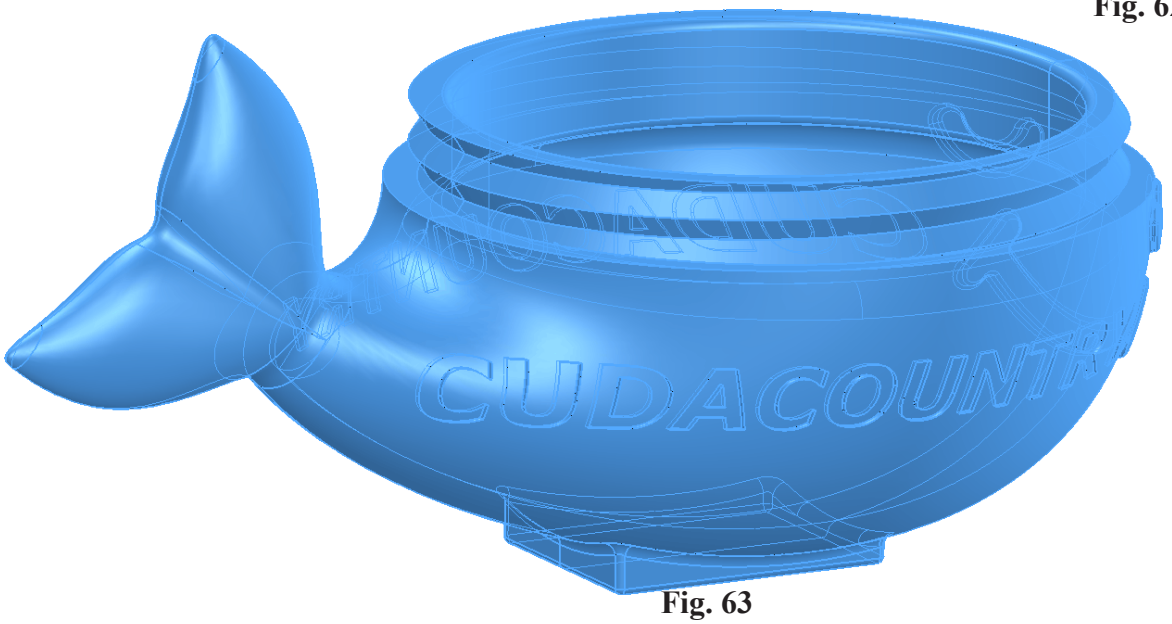


Fig. 63