1) Use Working Model (WM) to model the two inversions of the Wanzer needle bar mechanism shown below. Provide position, velocity and acceleration MATLAB graphs for point G as a function of rotation angle with disk 2 rotating at constant 240 rpm CW. Attach a screen shot of your WM mechanism and provide hard copy of your code.

Which of these inversions would be used for a sewing machine? Why?

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Inversion 1 Inversion 2

slider 4 in slot C, slider 5 in slot B slider 4 in slot B, slider 5 in slot C

E

F

A hidden under link 3

2

3

4

5

slot B

slot C

G

6

slot D

E

F

G

A

2

3

4

5

6

slot B

slot C

slot D

EF = 16 mm

FG = 56 mm

EG = 62 mm

r2 = 31 mm radius of disk 2

eB = 10 mm radial offset for slot B

eC = 10 mm radial offset for slot C

BC = 90º between slots B and C

w = 5 mm width of slots B, C, and D

2) Check your WM velocity solution for Inversion 2 using instantaneous centers at the position shown below with disk 2 rotating at constant 240 rpm CW. The mechanism is drawn to scale full size. Show your work.

VG \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

5

G

A

2

4

6

slot B

slot C

slot D

3

F

E