

Toluwanimi Odemuyiwa, Jason Li, Fadime Bekmambetova, Rong Guan

**The Grip:**

Outer Polyurethane Layer: **Sorbothane** <http://www.mcmaster.com/#ultra-soft-polyurethane/=mbl7yh>

- Durometer hardness of 70 on the Shore OO scale (since in golf patent, the outer layer has hardness of 20 on Shore A scale)
- Thickness: .76 mm
- Circumference: 106.8mm (34mm \* pi); height of 110 mm

<http://www.mcmaster.com/#ultra-soft-polyurethane/=mblssf> picked 8824t13 a 6\*12 sheet?

- Each sheet can make up approximately 4 grips if we cut down the thickness to the one we need
- So price is \$14.75/2 = **\$7.375**

**Natural Felt Layer:**

Extra firm white f1 felt <http://www.mcmaster.com/#felt/=mbm42d>

- 12\*12 sheet fits 4 grips; but thickness of 1/16" then 8 grips can fit = 12\*12 sheet is \$8.04; around \$1
- But if we do 12\*60 sheet, it fits 20 overall fits 40 grips \$22. Something; around \$.56625 So we pick 8755k122 product; and each thing costs **\$0.57 \*2 grips = \$1.14**

	Hard			Extra Firm	Firm	Soft		Very Soft		Ultra Soft
Felt Grade	S2-32	S2-24	S2-20	F1	F3	F5	F7	F10	F13	F26
Firmness (10% Deflection), psi	121	86	58	21	13	6	6	4	3	1
Density, lbs./sq. yd. @1" thick	32	24	20	16	15.6	12.2	12.2	8.4	8.4	7.2
Minimum Wool Fiber Content	100%	100%	100%	95%	85%	95%	80%	95%	75%	45%
Durometer Hardness (Shore A) ±5	80	55	50	35	35	25	25	20	20	10
Tensile Strength, psi	500	600	500	500	400	400	250	225	75	Not Rated

**Shore A of 35 +- 5 which fits patent's criteria of 45 +-5**

Inner High Density Polyurethane:

- $34 - 0.76 - 0.04 = 33.2$  mm diameter from the outside 102 mm circumference → pick 12\*48 inch 8789k15
- Cost is  $16 * 12 = 192$  grips from one sheet = \$0.40 for each grip \*2 = **\$0.80**

<http://www.mcmaster.com/#standard-polyurethane-sheets/=mbmlcr>

Synthetic Rubber

Chosen material: EPDM (proof → the patent) choose

3/8" ±0.047" 8610K87 31.08 8610K77 51.82

<http://www.mcmaster.com/#epdm-rubber-sheets/=mbn4m6>

each sheet fits 16 if we pick 12\*24, 3/8" (cut in half to get desired thickness)

cost: \$3.24 per grip; gives **\$6.48** for both

Total for grips: **\$15.80**

#### **Aluminum Frame:**

1) Price of Tube:

Multipurpose Aluminum (Alloy 6061) Tube 1-1/4" OD, 3/4" ID, .25" Wall Thickness, 3 ft Length:  
\$28.06

Multipurpose Aluminum (Alloy 6061) Tube 1/4" OD, .152" ID, .049" Wall Thickness, 1' Length:  
 $\$6.10/6 = \$1.02$

2) Price of normal handlebar:

Sunlite - Touring North Road, Alloy Bicycle Handlebar: \$30.00

Origin-8 Bullhorn Pursuit Style Handle Bars 26.0 x 40cm: \$20.00 - \$40.00

3) Price of Bending Machines:

CNC Machines: \$30,000 - \$50,000

General Aluminum Bending Machines: \$8,000 - \$35,000

#### **Inside of handlebars**

1) Upper thinner part

Multipurpose Aluminum (Alloy 6061) Tube 7/8" OD, .805" ID, .035" Wall Thickness, 1'  
Length:  $\$7.92/2 = \$3.96$

2) Lower thicker part

Multipurpose Aluminum (Alloy 6061) Tube 1-1/2" OD, 1.402" ID, .049" Wall Thickness, 1' L:  
 $\$13.40/4 = 3.35$

Total: **\$36.39**

#### **Platform:**

1) Rubber Portion:

Firm-Backed Super-Cushioning Foam Sheet Polyurethane/Polyethylene, 1" Thick, 24" X 24":  
 $\$35.06/35 = \$1.00$

2) Aluminum Portion:

Multipurpose Aluminum (Alloy 6061) 1/4" Thick, 12" X 12":  $\$20.11/3 = \$6.70$

Total: **\$7.70**

**Brake Lever:**

1) Current Levers

Avid Speed Dial 7 levers: \$19.13 - \$31.98

Pyramid Economy Mountain Bike Brake Lever Pair: \$10.99

Tektro RL726 Cross Levers for 26mm OD Bar Black: \$17.75

Total: **\$17~**

**Already did ball bearings: \$21.84**

**TOTAL COST: \$98.73**