16.05.2018

CART ROWER - FINAL REPORT

THREE MUSKETEERS

GES

ŞENER TOSUN **GAMZE SAÇMAÖZÜ** **EREN ÇELİK**

INDEX

1. Introduction

a. Introduction of team members

Name	Department	Task
Gamze Saçmaözü	Mechanical Engineering	Leader, Drawer, Speaker
Şener Tosun	Manufacturing Engineering	Drawer, Researcher, Speaker
Eren Çelik	Manufacturing Engineering	Secretary, Drawer, Researcher

b. Statement of purpose of presentation

The purpose of this project is to find out a new approach for a better design for a cart rower by:

i. Defining standards
ii. Brain storm about the project
iii. Analyzing designs made before
iv. Finding one main solution and at least alternative solution
v. Time planning for the project

2. Steps followed during designing process

a. First step

i) Statement of Time Plan

A										
B										
C										
D										
E										
F										
G										
H										
I										
X										
WEEKS	5	6	7	8	9	10	11	12	13	14

Not Finished Activity	
Finished Activity	
Time Now	

A: Definition of the problem

B: Presentation of first report

C: Research

D: Find a solution of problem

E: Definition of the all material

F: First basic prototype of project

G: Presentation of second report

H: Final prototype of project

I: Preparing of final presentation

X: Date for team meetin

ii) The general design in Autocad:

- The summary of the project and the key decisions made in the last few weeks are given below
- Almost all of the components are designed (but not precisely)
- The accurate dimensions are given in the draft design
- 2 sectional views of body and steering extension are to be drawn in AutoCAD
- Necessary tolerances are to be given

b. Second step

The general design in Solidworks:

- Main parts and fasteners are designed and done.
- The materials of parts are chose
- The adequate dimensions are given to all of the components
- Each component is drawn in Solidworks
- Yet, the assembly is not made in the assembly section of Solidworks. Whole is drawn as one integrated unit
- Necessary views are shown on the A2 layout
- Dimensions and sources of dimensions are already labelled in the previous report, for this reason, in this period dimensions are checked once more regarding to source written in the previous report.

i) Main parts

- Body 1 and body 2
- Chair
- Steering
- Back wheels and front wheel
- Wheel housing
- Security arm

c. Third step

- Market investigation are done
- Cart rower is priced out
- Presentation is prepared
- Brochures, logo and poster are prepared

EGE TOROS BORU

EK LİSTE

Sanayi Borusu

Ebat	TL/mt.
17,0x2,00	1,75
21,3x3,00	2,44
88,9x6,00	23,17
139,7x3,50	21,11
159,0x4,00	27,73
159,0x5,00	33,60
168,3x3,50	25,75

Kalın Etli Sanayi Borusu

Ebat	TL/mt.
219,1x4,50	45,54
273,0x4,00	49,13
273,0x4,50	56,97
273,0x5,00	62,17
273,0x6,00	76,41
273,0x8,00	100,72
273,0x9,00	113,37

Kutu Profil

Ebat		TL/mt.
80x80x6,00		28,75
90x90x6,00	60x120x6,00	32,32
100x100x2,00	80x120x2,00	11,57
100x100x2,50	80x120x2,50	13,21

Kalın Etli Kutu Profil

Ebat		TL/mt.
100x200x10,00	150x150x10,00	95,67
200x200x10,00	150x250x10,00	134,49

**** Fiyatlarımıza KDV dahil değildir.***

name of part	material	height(mm)	diameter(mm)	width*length(mm2)	volume(m3)	thickness		price tl
base		500	30					2,5tl
body1		500*2	20					4
body1		500						
body1		300		30*30				0,87
body2		300		26*26				0,8
front wheel		30	120					10
wheel housing					0.0012			
seat	balsa				0.01			
security arm		1000	30					2,84
spring								15*2
steering		400	30					1,14
back wheel	polyurethane							13*2
ring bearing	paslanmaz çelik							15*2
							toplam malzeme	108,5
							işçilik ile	200
							%25kar ile	250

3. Explanation of problem

a. Consideration of human factors

- More comfortable, more durable, and securer design

On the other hand,

- Careless users of the cart rower might break the main body
- Overweight people standing on the cart rower will cause fracture in some joints.
- Extremely heavy objects put on the cart rower will cause damage

b. Coverage of economics (manufacturing, shipping, packing, overhead, mark-up, etc.)

- Apart from balsa wood for chair, no extra material different from stainless steel and structural steel is used. In fact, the only manufacturing process needed to be applied is bending profile and welding.
- The folding function makes the cart rower both portable and easy to get packed.
- The front wheel was lowered to reduce cost.

c. Coverage of alternative solutions considered

- First of all, the first body to be designed is combined with the second body to form the main body.

However,

- It was decided that the center of gravity of the seat should be raised. This would make the cart rower move more evenly.
- Instead of seat belt, security arm is done.
- Suspension has been added to the rear wheels to provide more comfortable driving on the way up the drive.

For those reasons, we changed our design to our current cart rower.

4. Overview of solution,

- Design concept
- Rationale
- Limitations

5. Summary

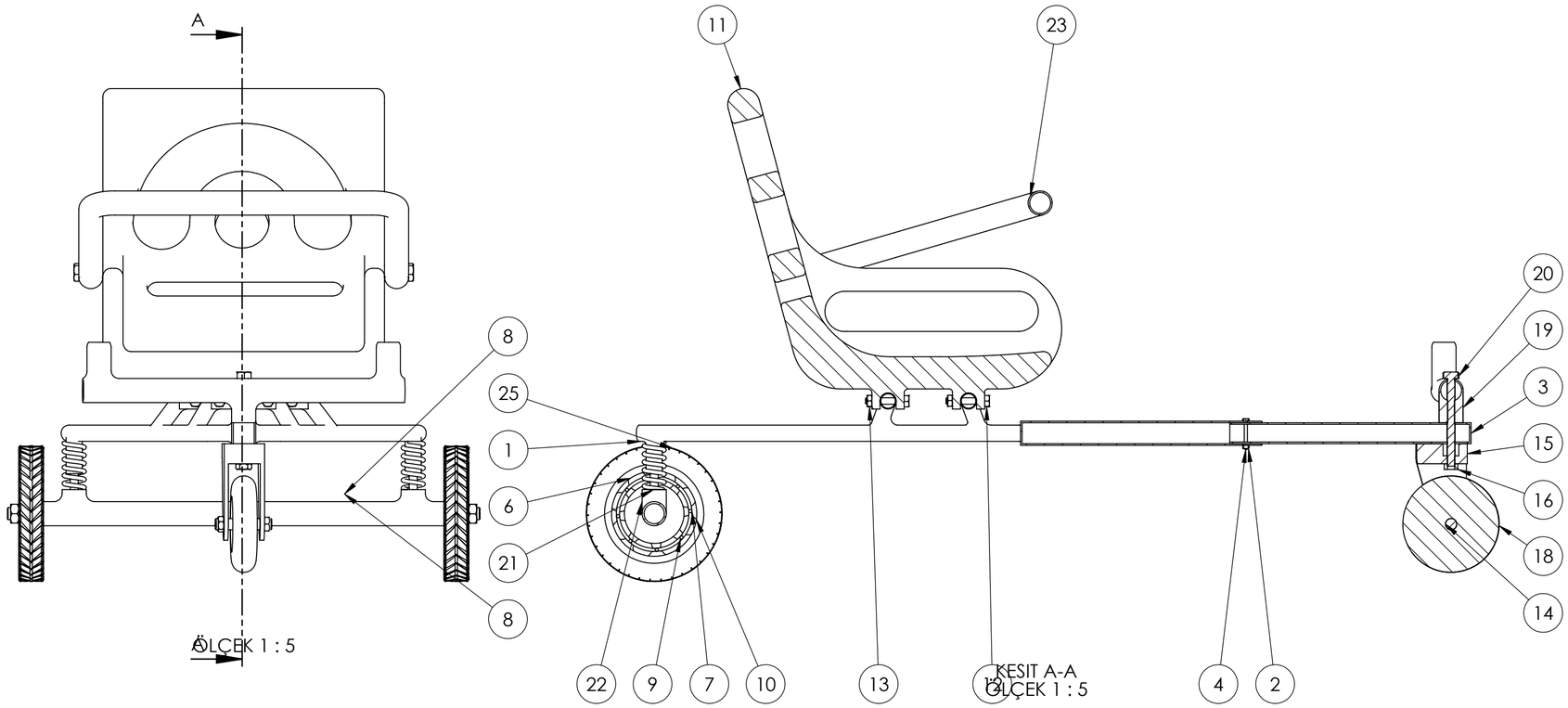
Provided a safe and comfortable cart rower to fun.

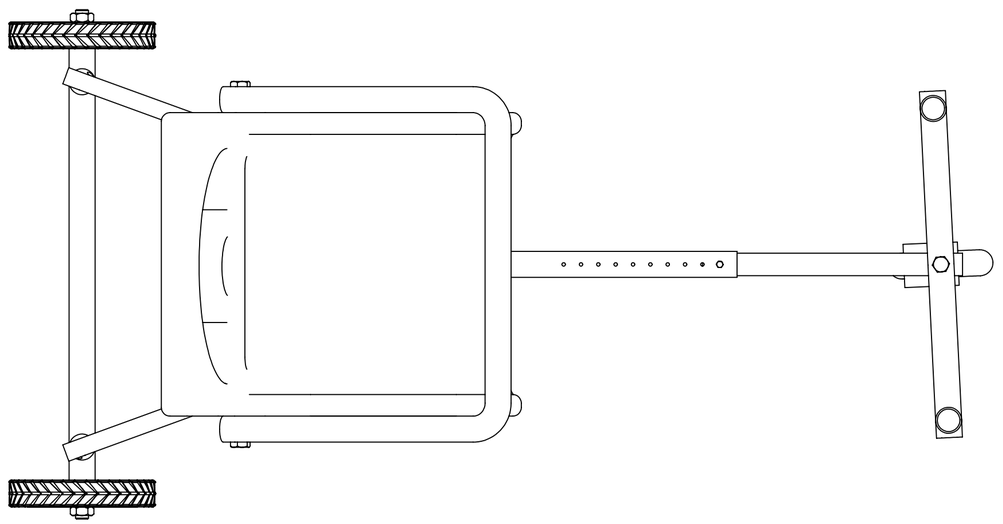
6. Recommendations

- Careless users might break the main body, so use it gently.
- Overweight people standing on the chair will cause fracture in some joints.
- If sharp object is placed on top of the chair, fabrics may be ripped off, do not try to cut it.
- Extremely heavy objects put on the chair will cause damage, do not put heavy objects on it

8. Conclusion

- 3D Solidworks draft is designed.
- Additional parts are added
- The project is tried to be finished at least 5 days before the deadline to ask for suggestions.
- Extended bill written.
- Surface finishing symbols is given.
- The assembly is made in the Assembly section of the solidworks.
- The final report is prepared and combined with the presentation.





ÖĞE NO.	PARÇA NUMARASI	TANIM	MİKT.
1	Body 1	stainless steel	1
2	Hex Nut 1	M4 x 4	1
3	Body 2	stainless steel	1
4	Hex Bolt 1	M4 x 35	1
5	Roller Bearing Assembly	stainless steel Ø150x30	2
6	Seat	balsa wood	1
7	Hex Bolt 2	M8 x 48	4
8	Hex Nut 4	M8 x 6	4
9	Stud Bolt 1	M14 x 70	1
10	Wheel Housing	stainless steel	1
11	Hex Nut 2	M10 x 4	3
12	Hex Nut 5	M15 x 6	2
13	Front Wheel	Aluminium alloy	1
14	Steering	stainless steel	1
15	Hex Bolt 3	M10 x 110	1
16	spring	Ø5 x Ø25 x 60	2
17	Base	stainless steel	1
18	Security arm	stainless steel	1
19	Hex Bolt 4	M12 x 45	2
20	Back Wheel	POLYURETHANE	2

CART ROWER			İTÜ.School of Mech.Eng. Department Mech. Eng.	
Scale 1:5	Checked by H. Mustafa Özkırım	Programme	Name & Surname	ID no
		Mech. Eng.	Gamze Saçmaözü	30160207
		Manuf. Eng.	Şener Tosun	30160334
		Manuf. Eng.	Eren Çelik	30160304
		Date : 15.05.2018		