DESIGNING PRESS MACHINE CANNED SOFTDRINK TO REDUCE VOLUME WASTE OF CANNED SOFTDRINK

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Abstract

Many processes in the industry originally done by humans, are now being replaced by machines that are driven automatically by simply giving commands / programs or just simple / semi-automatic buttons. This is intended for human energy efficiency and the effectiveness of completion time, due to the rapid progress of human resources (Human Resources) so that it is no longer possible to do the work manually with great energy. This Final Project aims to plan, manufacture, and test semi-automatic press machines for the purpose of automation of engine press. Methods in the design of this machine is the study of observation. From the design is done, generated a semi-automatic press machine, with the following specifications: Capacity of compressive strength with the power of pressing 150 kg. The electric motor used has a power of 0.5 PK and 1400 rpm rotation. Total cost for the manufacture of 1 unit of this machine is Rp 1.714.000, -.

Keywords: Design tool, Press cans

1. Introduction

In the daily life of the many aluminum cans that are found around us to be a waste that can disrupt the environmental cleanliness and it has not been well treated with recycling. Due to the biggest beverage manufacturer in Indonesia today is very less waste processing system cans. Lack of awareness and public appreciation for the use of recycled products is also one of the reasons for the unpopularity of recycled products in Indonesia. We also see in the daily life of the collectors of used goods, especially for aluminum cans to press the cans, they do it by stepping on or hitting cans with a hammer so that the cans can be destroyed or the volume is reduced. This can be risky because the impact of tin canning and also beatings with a hammer can repeatedly hurt them, sometimes resulting in injury. The purpose of making this tool, reducing waste volume, save energy, efficiency time, reduce waste volume



Figure 1. The can press tool works

The resulting rotation power is transmitted to the reducer where the resulting rotation of the gearbox is connected to the drive system (axle, bearing) to the arm and the piston press so that the forwarded rotates the piston back and forth on the piston cylinder so that the cans on the piston cylinder can be pressed and dropped at the cans.

2. METODS

Methods used in this study is planning and calculation of the dimensions of the machine, then proceed with design drawing and machine manufacture and testing of the machine



Figure 2. Design Tool Press can

Pressure in the softdrink (F) = 38 kg F= 38 kg \cdot 9,81 m/s F = 372.78 N By looking at the experimental results above, then taken in the design of the machine with

then taken in the design of the machine with the force of the press on the can of drink (F) = 372.78 N, and pressure to push softdrink canned

Pressure need to pressing softdrink canned : P = F/A

P = Pressure (N/m²)A = Surface Area (cm²) F = Force (N)

$$P = F/A$$

= 38/6,7
= 5,67 Kg/cm²

Thus, the pressure received by the piston on the first collision is $38 \text{ kg} + 5.67 \text{ kg} / \text{cm}^2$ of 43.67 and after the can of dents slightly dents the piston pressure back to 38 kg. The products that can be processed by this press machine is a tin bottle with the following data, cans softdrink made of aluminum material. The following table is the size of the junk cans on the market.

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No	Parameter	Minimum	Maxsimum	Avarage
1	Weight (g)	10	15	12.5
2	In Lenght (cm)	80	230	155
3	Diameter (cm)	40	80	60

Source :Research Data,2017

= 2

	р	= 36 cm	V	$= 6 \times 3 \times 2$
	Ĩ	= 20 cm		= 36 cans
	t	= 23 cm		
	V	= p x l x t	Number of can	s inserted in carton after press
		$= 36 \times 20 \times 23$	D	= 60 mm
		$=16560 \text{ cm}^3 / 16,56 \text{ m}^3$	р	= 115 mm
			ĨV	= p x l x t
Number of cans inserted in cardboard before		р	= 360 : 60	
press				= 6
_	D	= 60 mm	1	= 200:60
	р	= 115 mm		= 3,33/3
	V	= p x l x t	t	= 230 : 2
	р	= 360: 60 = 6		= 11,5/ 11
	1	= 200 : 60 = 3,33/3	V	= 6 x 3 11
	t	= 230 : 115		= 198 cans
		2		



Figure 5. The size of the original and after the press

3. Result and discussion

Based on the initial test of this tin press tool then this tool works well. Where the tool can

help the worker to do the pressing of a can before using mechanical power



Figure 6. Pressing using press tool

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Figure 7. Pressing using mechanical power

NO	Methods	Time	Result	
1	Machine Press	2 second	1 pcs	
		60 second	30 pcs	
2	Human power	5 second	1 pcs	
		60 second	1 pcs	

1. Tin pressing using this press tool only takes 2 seconds for 1 can of drink, if this canned tool is operated 1 minute relentlessly able to produce 30 cans of drinks that have changed the size of the original 11.5 cm to 2 cm.

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2. Pressing the can with a little more mechanical power takes 5 seconds to press 1 can of softdrink. Indeed, with mechanical power the size of the can is 11.5 cm in length can be thinner than the cans produced from the can press tool itself that is able to press the beverage cans with a size of 2 cm, irregular thickness depending on the energy we spend can be thicker than 2 cm can be thinner than 2 cm.

4. Conclusion

Based on the results of the discussion and design in this study can be drawn the following conclusions:

- 1. With this canned press machine, recycling work will be faster, easier and lighter than mechanical power.
- 2. The canned press machine is able to minimize the dimensions of waste cans. This can have an impact on the economic value, because the weight of the canned

waste is not mixed with the weight of the water that can cut the price on the selling point.

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