Kinkajuice Product Contract
Yellow Team

Product description: Portable, efficient and inexpensive human powered device for charging a battery to power a Kinkajou projector
Intended customers: Kinkajou users
Intended use: Charges a battery which would run a village's 6W Kinkajou projector during their adult literacy classes. Classes are typically every weeknight for 2-3 hours.
Market: Areas of underdeveloped nations with no access to on-grid electricity or other electrical power sources.

Customer Need	Product Attribute	Engineering Specifications
Does not need assembly	State it is delivered to the user in	Ready for use when received by customer (no assemble required by customer)
Can be easily distributed to teachers in rural villages	1. Size 2. Weight	1. Occupies no more than 0.45m x 0.45m x 0.45m of space (including voids) 2. Weighs at most 10 kg including battery
Able to be stored inside a classroom	Size	Occupies no more than 0.45m x 0.45m x 0.45m of space (including voids)
Usable by both genders and variety of ages	Range of users device can accommodate	Can be used by persons in Mali of mean height±15cm (heights of 145cm to 185cm)
Affordable for villagers	Unit manufacturing cost	Goal of $25/unit with battery; at most $50
Method of use is clear	Product form	No user manual required to know how to operate
Can only be used for the Kinkajou	Specificity of use	1. Battery cannot be removed from device 2. Equipped with outlet unique to Kinkajou
Motions used do not cause injury/health risk to user	User safety	90% of subjects testing device for the first time do not experience any discomfort or pain during use
Life span of housing matches expected life of Kinkajou (3 years)	Life span of housing	Housing lasts at least 3 years
Life span of battery lasts matches expected life of Kinkajou	Life span of battery	Battery lasts at least 500 charge/discharge cycles (~ 3 years of use)
Maintenance needs of generator component matches that of Kinkajou	Life span of generator	1. Generator lasts at least 100 hours of use before needing replacement (~ 1 year of use) 2. Generator component can be replaced when the Kinkajou microfilm is replaced
Generator can be taken out and replaced	Modularity of components	Generator can be taken out and replaced while the battery and housing stay the same
Battery can last two classes without recharging	Power of the battery	Battery stores no less than 30Wh power when fully charged.
Can withstand the dust	Protection of	All moveable parts are within a sealed housing

and keep bugs from getting inside housing	movable components	
Can be used on uneven terrain	Robustness	Works on the East Campus courtyard (comparable to ground in Mali)
Can withstand the heat	Temperature effects on performance	Function is degraded by no more than 5% up to 120^{o} F operating temperature.
Battery is charged efficiently	Charging efficiency	Goal of 10:1 use to charge ratio; at least 5:1
User is aware when battery is fully charged	User interface	LED facing the user lights up when battery is fully charged
Battery cannot be overcharged	Prolonging battery life	Internal circuitry stops charging the battery when it is fully charged even if device is in use