Please staple here

Solution 1

= trash

= trash movement

= movement of parts

Foldable solar panel provides power source for motor

copper wire runs from solar panel to motor to provide electricity

Axel, made of stainless steel to prevent rusting, holds buckets and rotates

Buckets other than mesh base, made of acrylic as it does not rust + durable

stainless steel frame holds axel in place

As buckets rotate, trash is picked out of water

trash falls from bucket to angled slope - slope allows trash to fall through

sea water

ship edge

Trash falls into moveable container for sorting + recycling

ship edge

Mesh of steel wire of hole size 20mm allows water to fall through, but not plastic garbage

PARTIALLY PERMIABLE

steel wire rotates causes upper cog to rotate, moving axel

motor + computer control rotation of axel.

* - positioning of support for buckets means that the buckets do not collide with the trash collecting device

Solution 2

= movement of parts

= trash

= trash movement

paddles made of stainless steel wire mesh, allows water to fall through

conveyor belt carries trash up, trash held in place by paddles

paddles rotate, picking up trash from sea water

solar panels provide source of power for motor

rotating gear turns wire, which rotates axel - powered by motor labelled M

trash from sea + sea water

trash falls into bucket, ready for sorting and recycling

ship

Stainless steel beams holds axels in place

Ship or boat edge

acrylic covering prevents water touching components

* motor, with power from solar panels, rotates cog, causing wire to rotate. This causes the upper rolling cylinder to rotate, which turns the conveyor belt

Arkwright Engineering Scholarships 25

In this moderately high scoring answer the candidate has produced three distinctly different ideas to solve the problem – a wheel with buckets; a conveyor belt; and rolling cylinders. At first it is not completely clear how the designs orientate to the boat but the candidate, very helpfully, indicates the boats edge in a different colour.

At the same time they also indicate movement in the device with a different colour, and this helps the reader understand the workings of the device. The use of directional arrows, especially in a different colour, is to be encouraged!

Annotations are written clearly and fairly unobtrusive arrows link the text to the design. Mechanical systems are employed and these display a very sound level of technical knowledge, but the systems are not always completely explained: in this section this level of explanation is satisfactory and the systems illustrated help the reader understand the underlying principles of the workings of his concepts.

Marker's Comment

Name:

School:

Section A or B: A

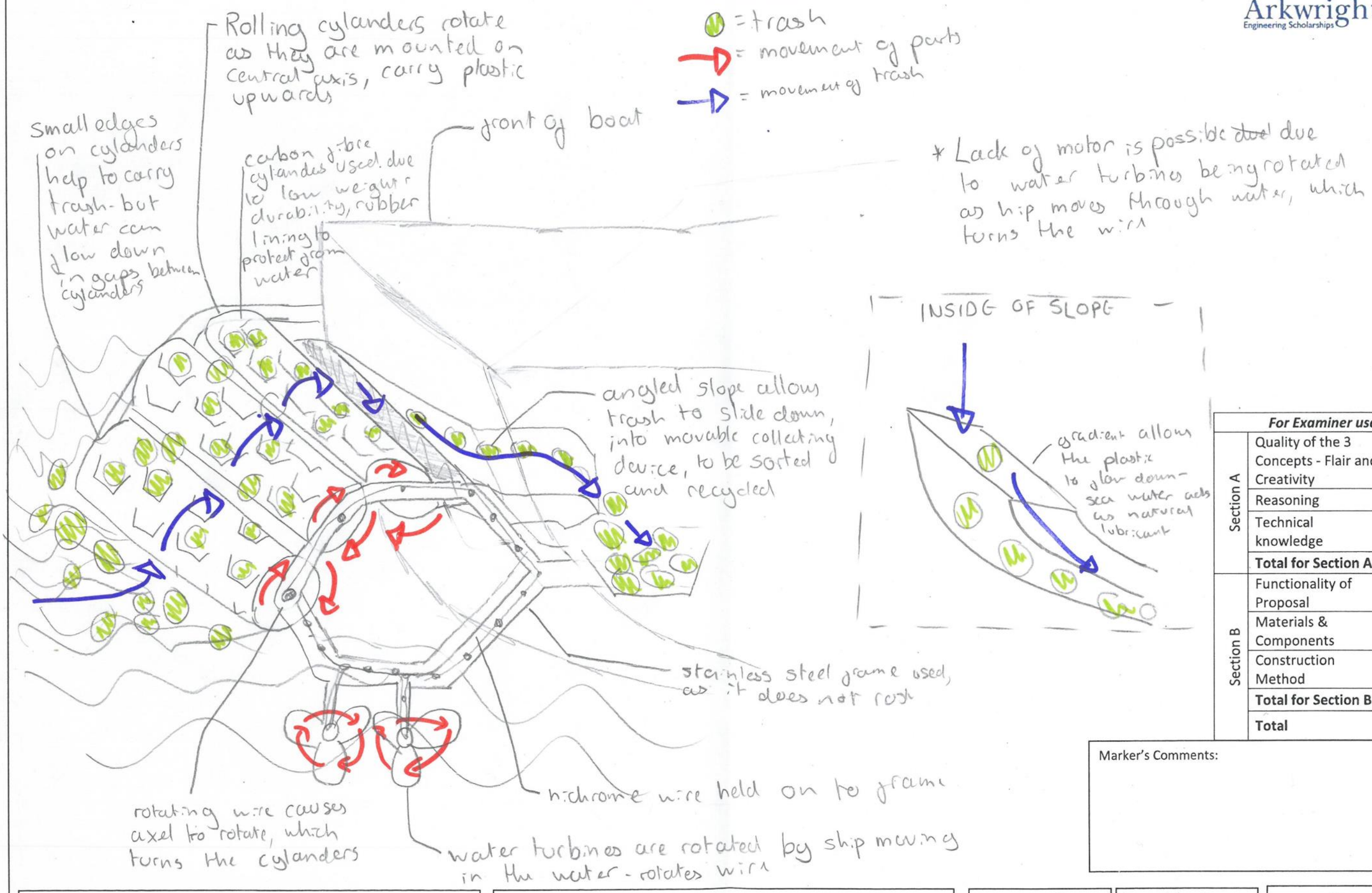
Question Number: 1

Page: 1 of 4

Please staple here

Solution 3

Arkwright Engineering Scholarships 25



For Examiner use only		
Section A	Quality of the 3 Concepts - Flair and Creativity	/30
	Reasoning	/10
	Technical knowledge	/10
	Total for Section A	**/50**
Section B	Functionality of Proposal	**/30**
	Materials & Components	**/10**
	Construction Method	**/10**
	Total for Section B	**/50**
	Total	**/100**

Marker's Comments:

Name:

School:

Section A or B: A

Question Number: 1

Page: 2 of 4