

CONCEPTS FOR
WHEELCHAIRS
TO
GO ON THE BEACH

ATTACHMENTS

TO STANDARD WHEELS

Sketch of the Device

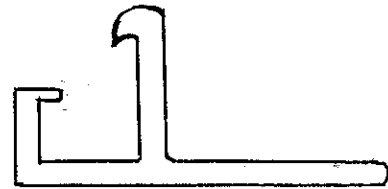
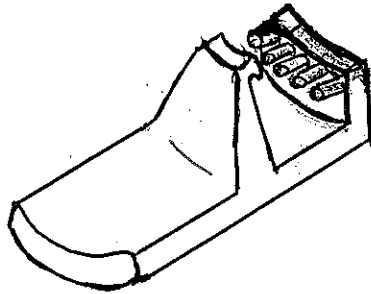
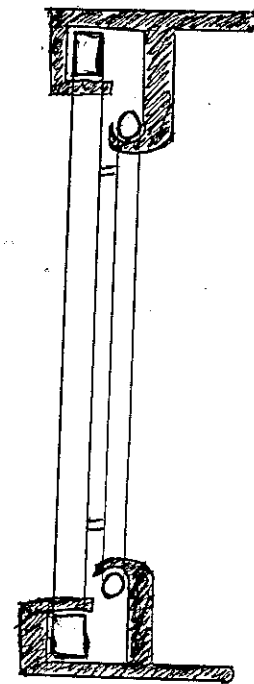
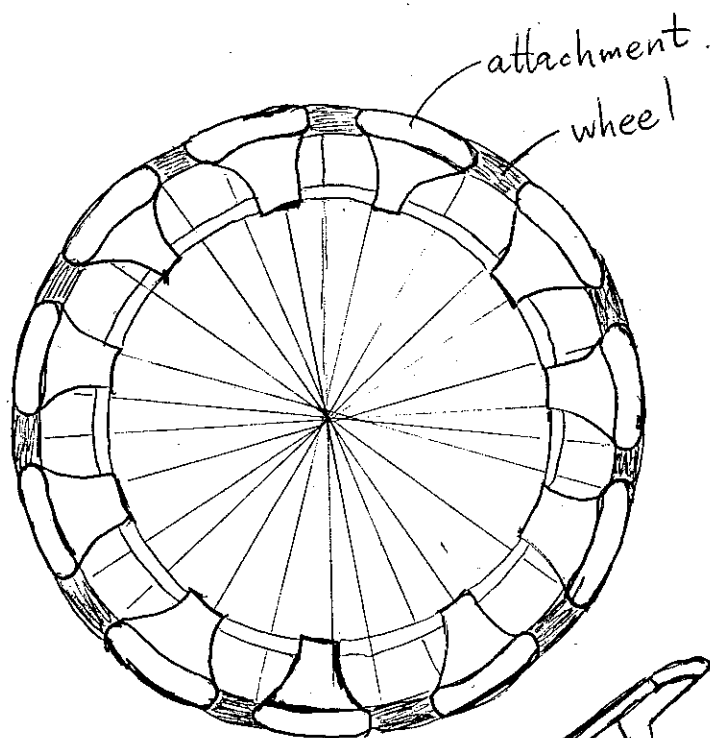
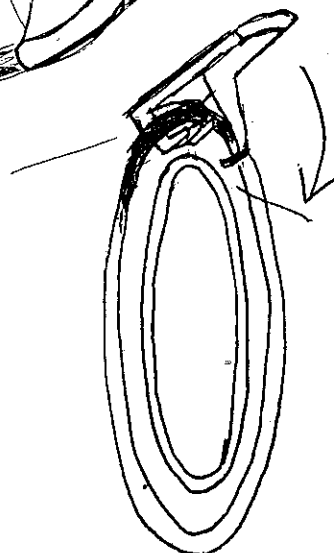


figure 1.

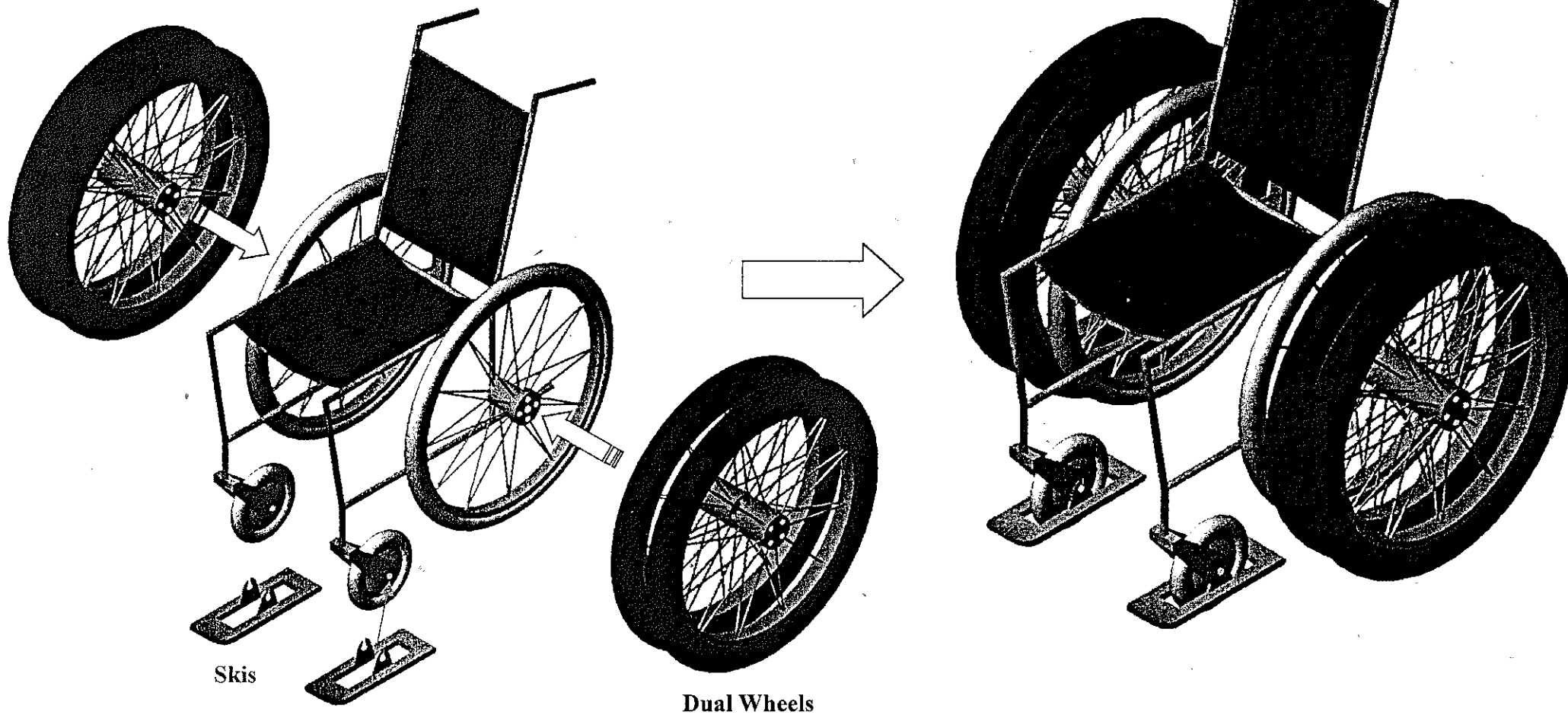
Attachment for the wheel

fixed between
frameworksclick on the metallic
wheel.

9752627

Wheelchair Retrofit

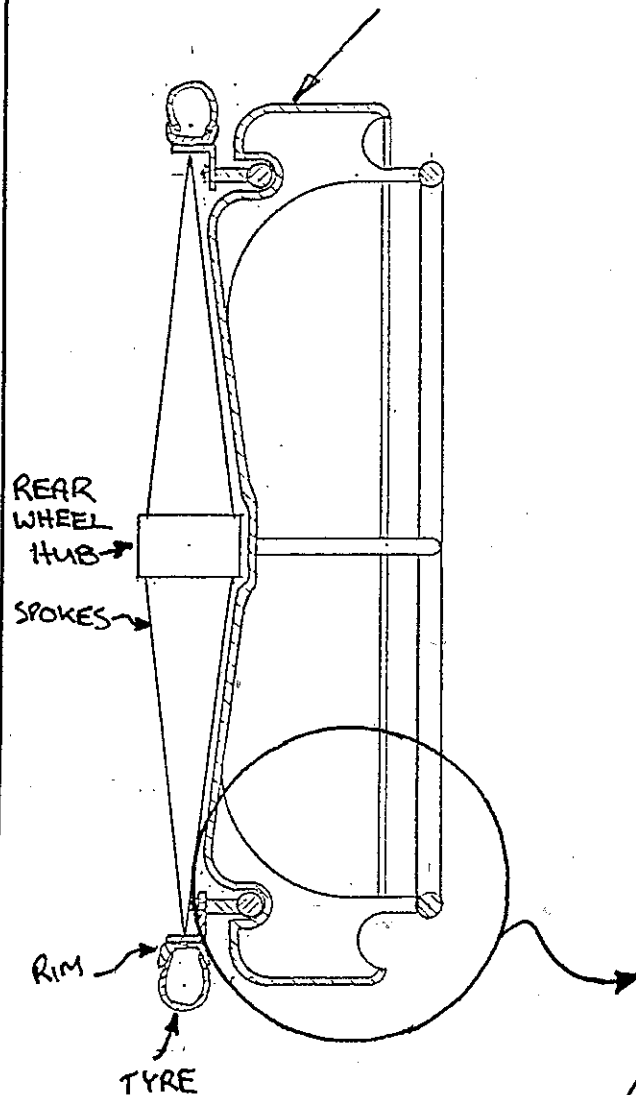
ENME 340 Michael van Ee



BEACH RETROFIT KIT FOR A WHEELCHAIR 9954545

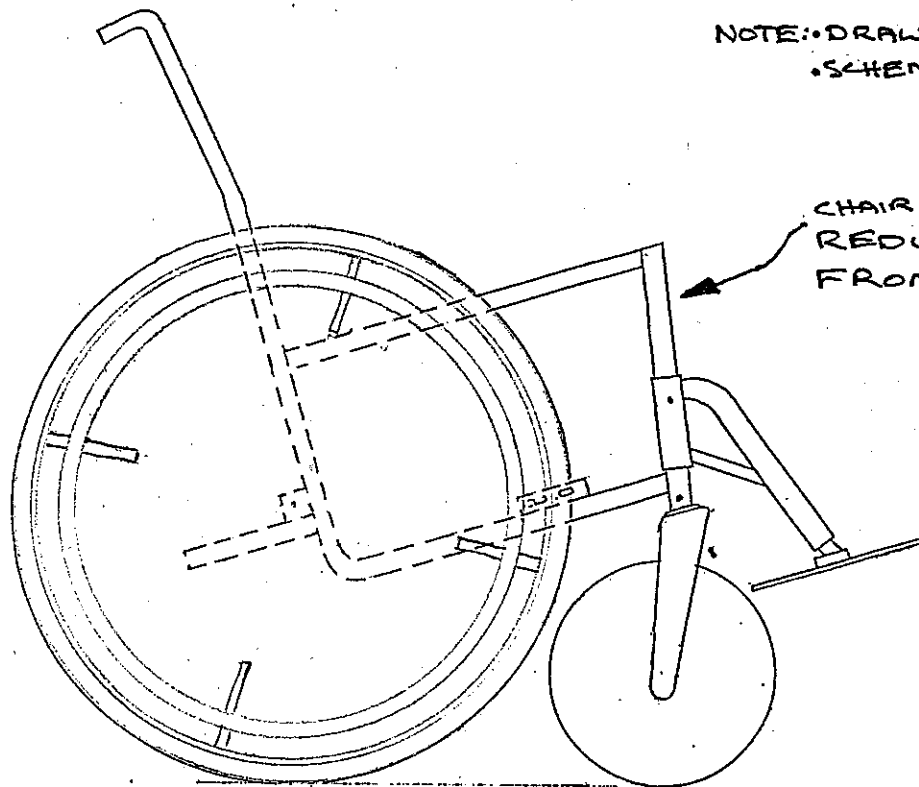
NOTE: DRAWINGS NOT TO SCALE
• SCHEMATICS ONLY

REAR SANDWHEEL



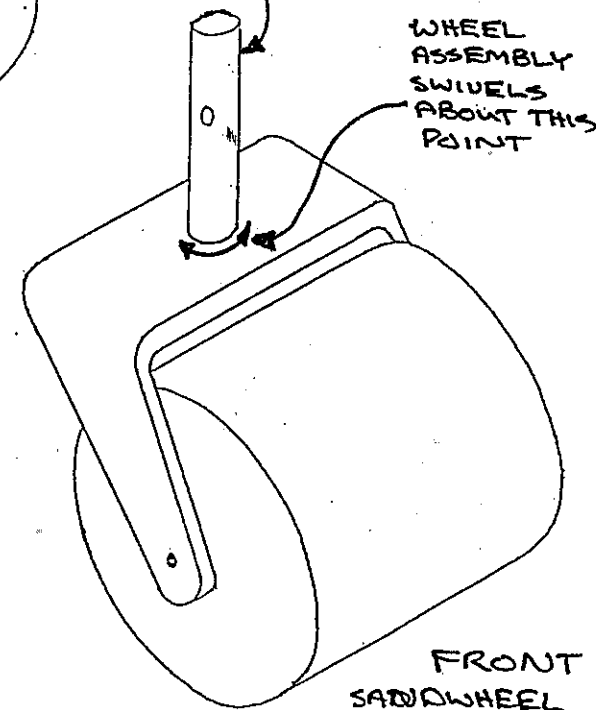
SECTIONAL
ELEVATION

EXISTING
HANDRAIL



SHAFT LOCKS INTO
W/C FRAME IN
PLACE OF FRONT
WHEEL

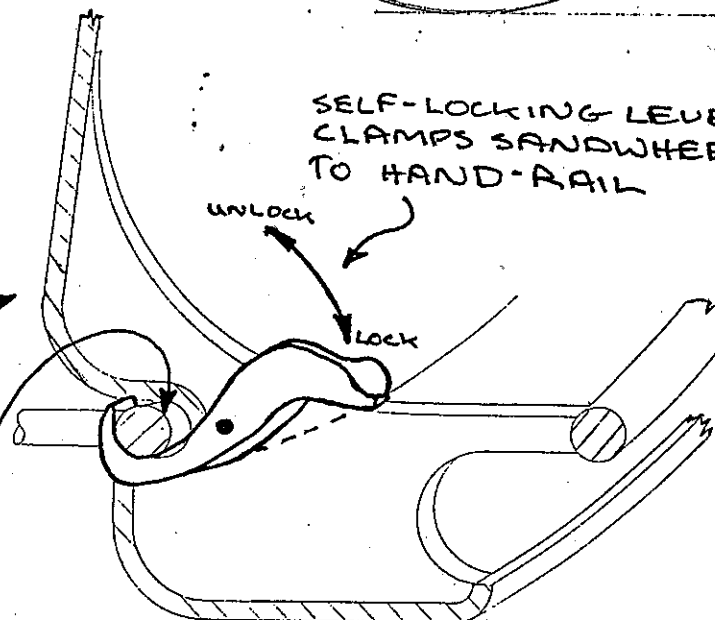
WHEEL
ASSEMBLY
SWIVELS
ABOUT THIS
POINT



SELF-LOCKING LEVER
CLAMPS SANDWHEEL
TO HAND-RAIL

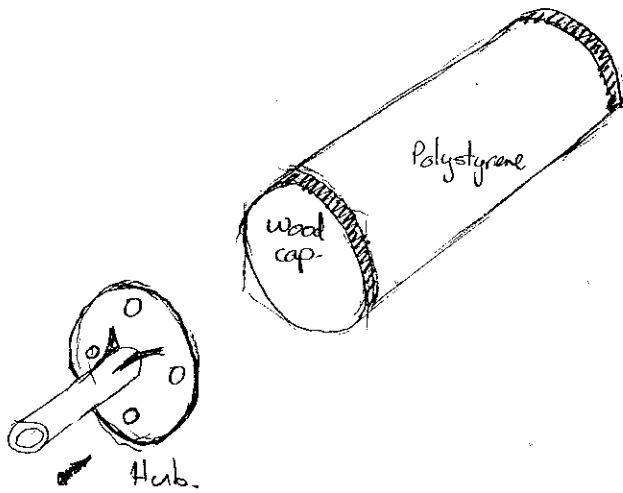
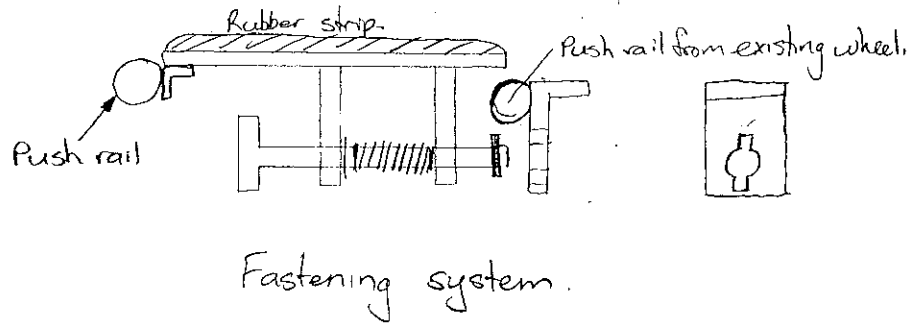
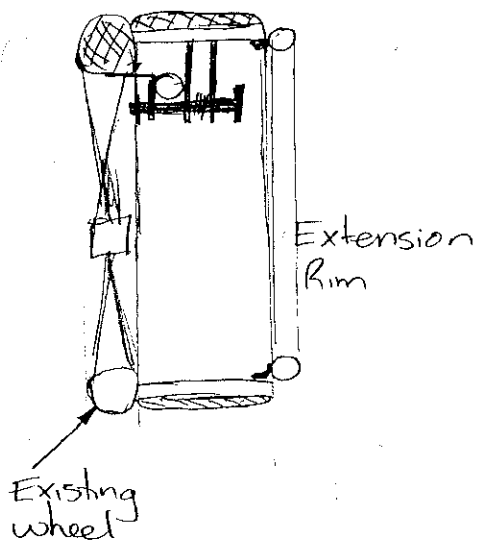
UNLOCK

LOCK

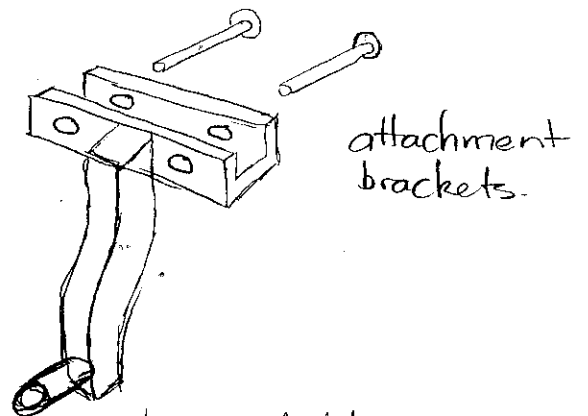


Rear Rims

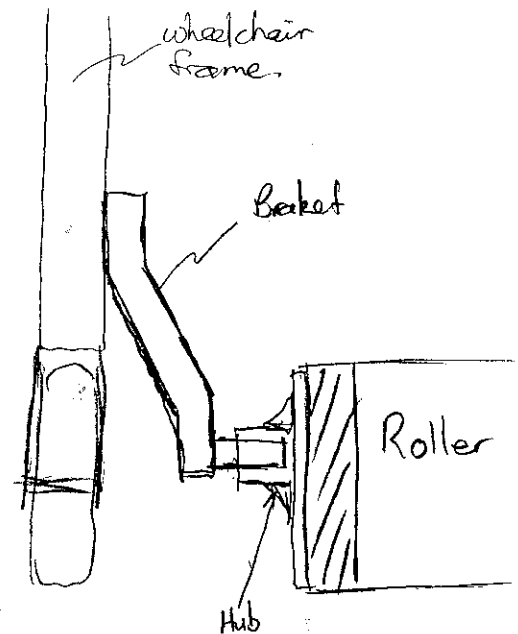
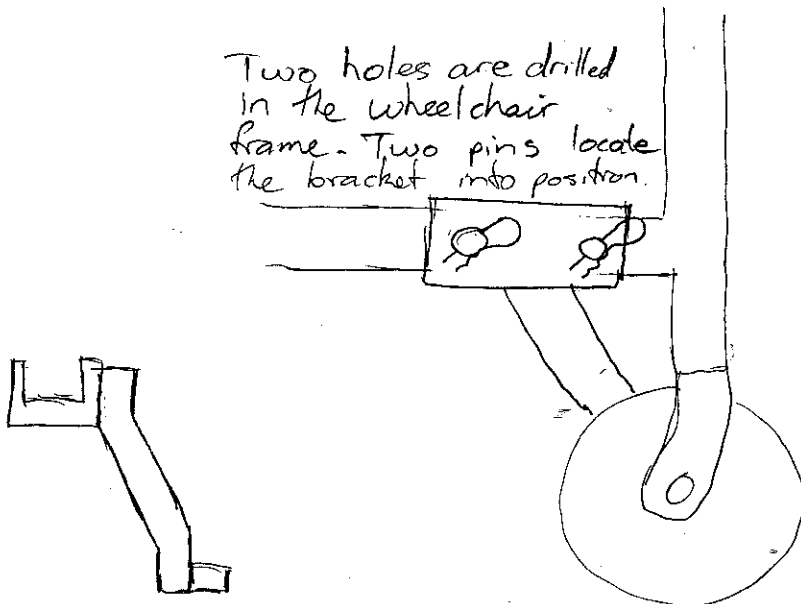
9955872



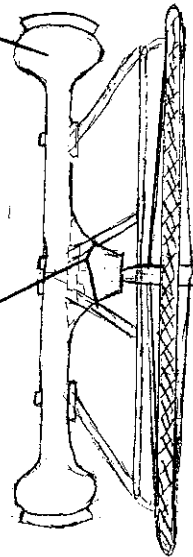
Front Roller



Two holes are drilled in the wheel chair frame. Two pins locate the bracket into position.



ONE-PIECE SLID
MOULDED PLASTIC
WHEEL Ø600

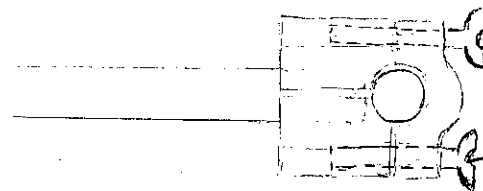


WHEEL ASSEMBLY

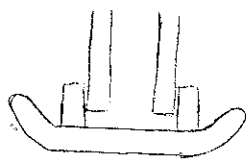
FOUR PAIRS OF
BRACES BOLTED
TO BEACH WHEEL
AND CLAMPED
TO HANDRAIL
OF EXISTING
WHEEL.

9806040

NOTE: THE ENTIRE BEACH
KIT CAN BE ATTACHED
AND REMOVED BY
HAND WITHOUT ANY
TOOLS. ALL ATTACHMENTS
USE 5/16" STEEL WINGS.

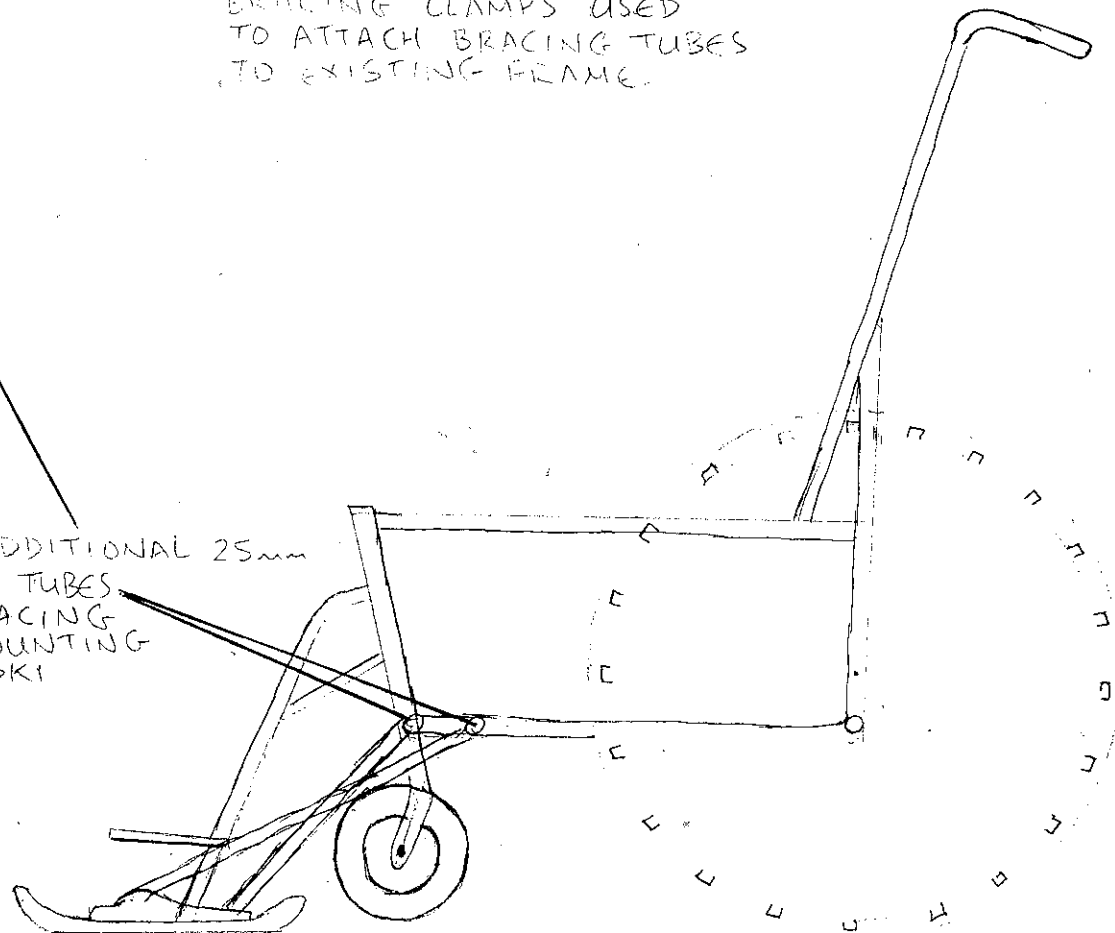


BRACING CLAMPS USED
TO ATTACH BRACING TUBES
TO EXISTING FRAME.



CROSS SECTION OF
FRONT SKI

THREE ADDITIONAL 25mm
5/16" STEEL TUBES
FOR BRACING
AND MOUNTING
FRONT SKI



STANDARD WHEELCHAIR ADAPTED FOR BEACH USE

Wheel Extensions

3

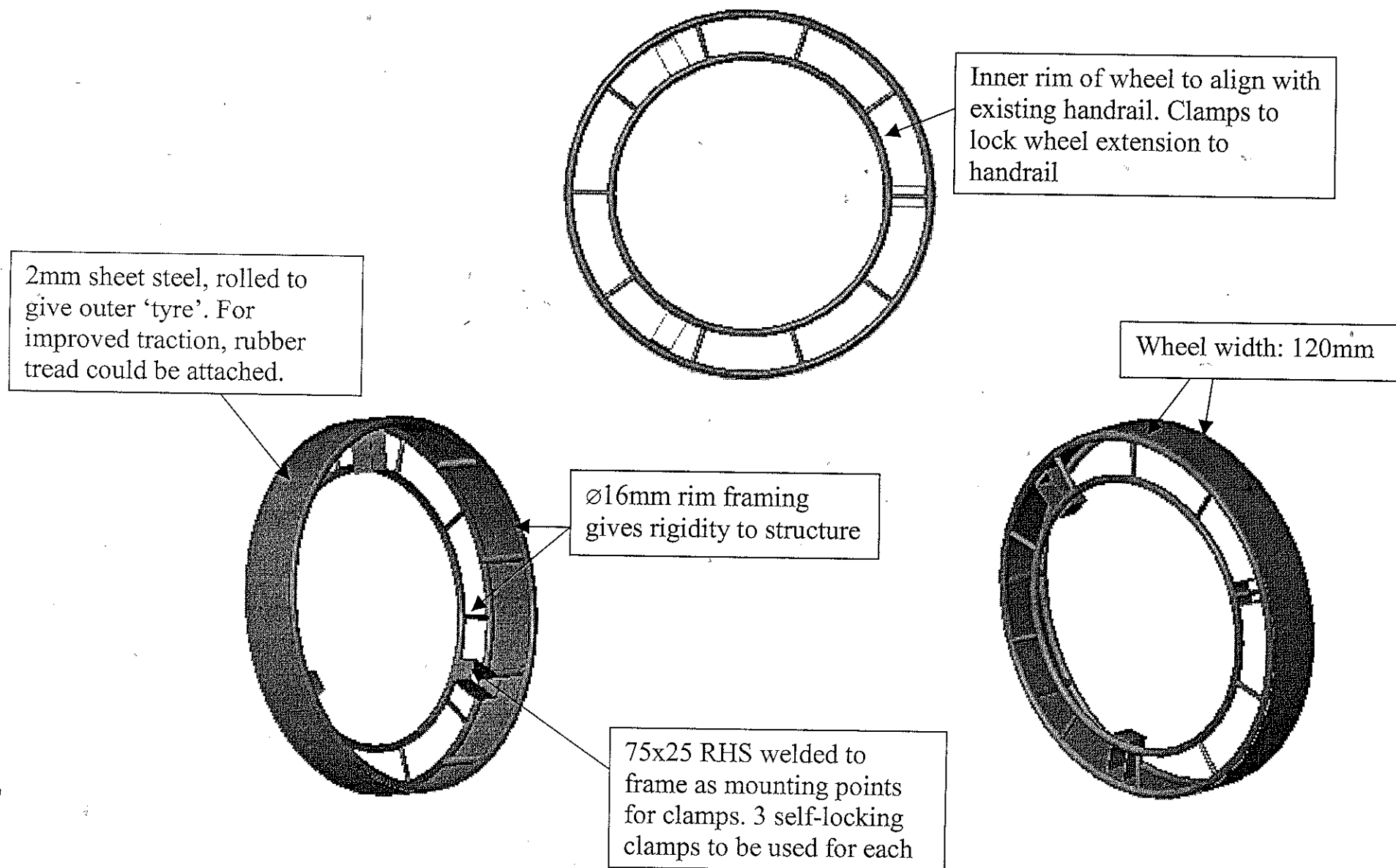


Fig 1.

WHEELCHAIR MODIFICATION PRO. SAL
INITAL SKETCHES

9901-248

NEW REAR WHEEL ASSY.

EXISTING REAR WHEEL
AND HANDRAIL

REAR WHEEL
REAR ELEVATION

STD. GROUND
LEVEL

NEW GROUND
LEVEL

MAIN ELEVATION

EXIST. SUBFRAME
DETAIL VIEW

EXISTING
FRAME

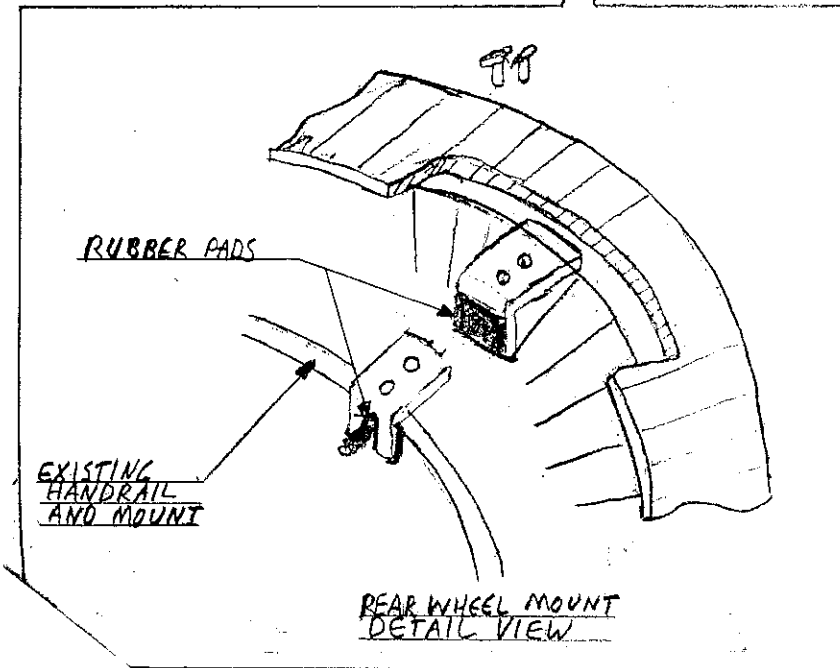
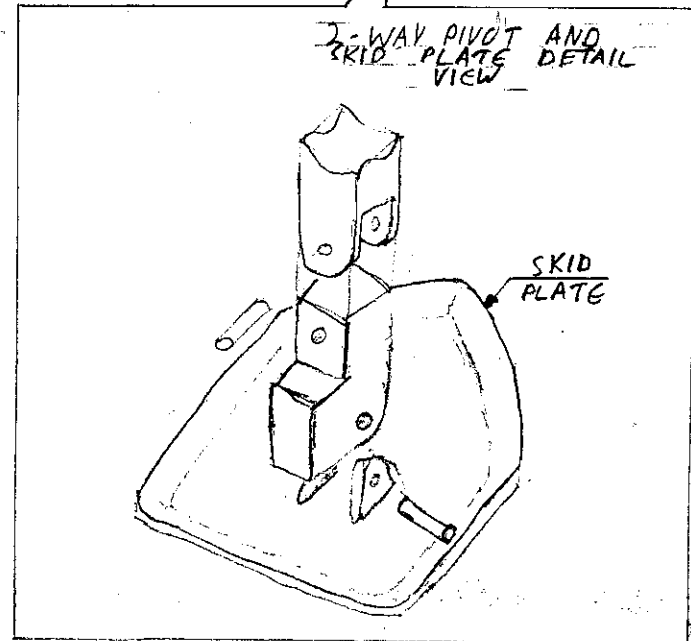
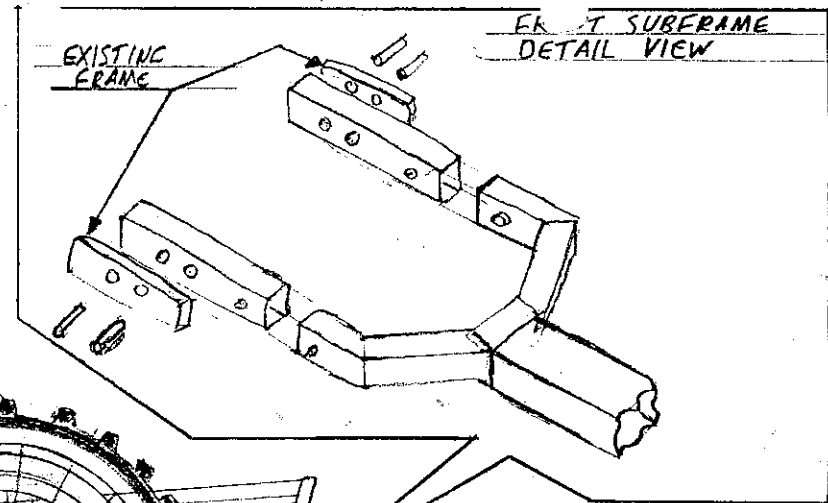
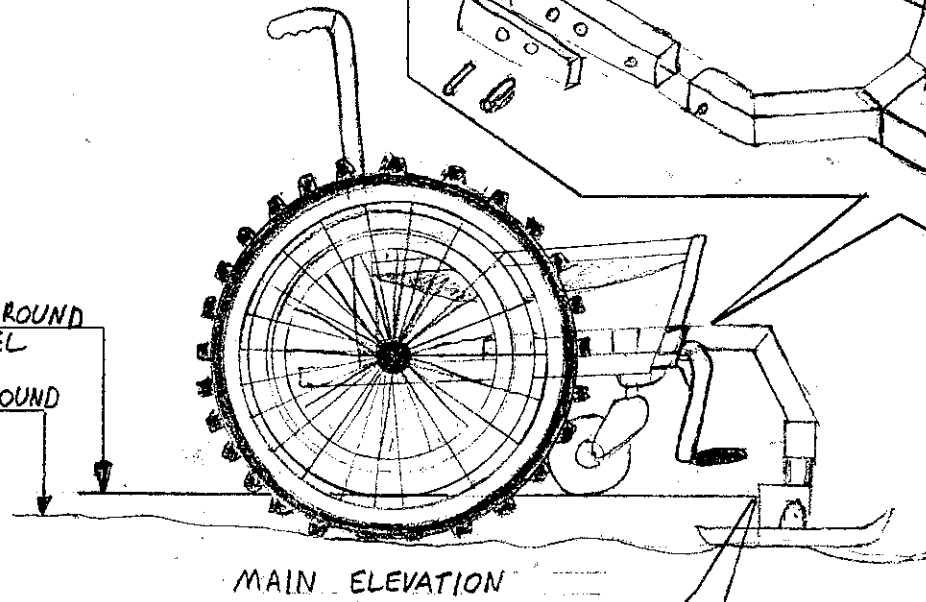
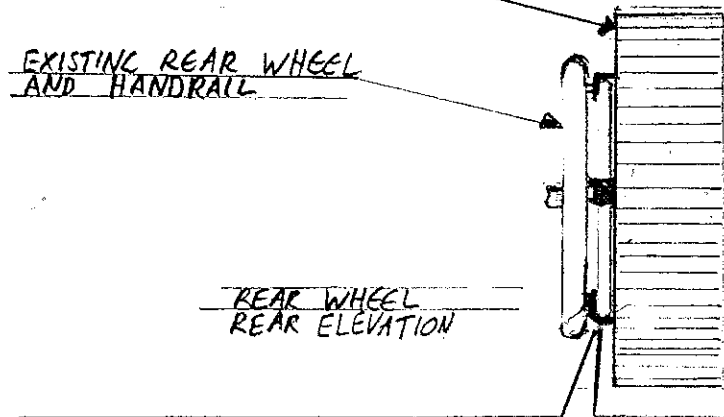
2-WAY PIVOT AND
SKID PLATE
DETAIL
VIEW

SKID
PLATE

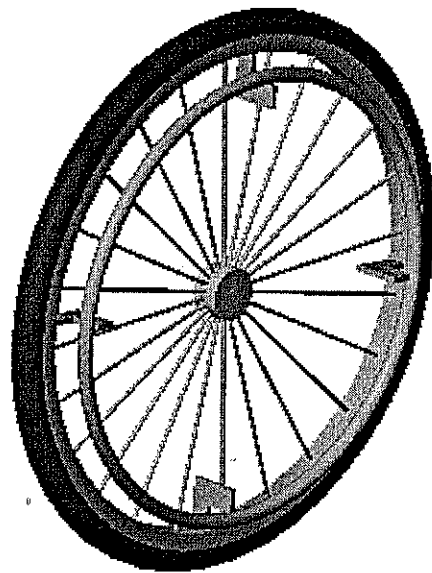
RUBBER PADS

EXISTING
HANDRAIL
AND MOUNT

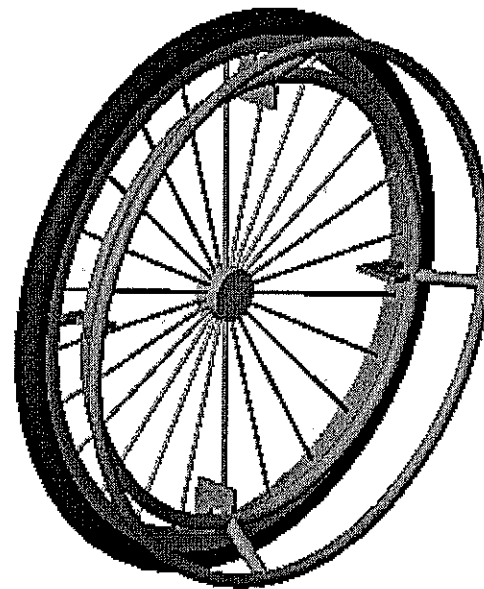
REAR WHEEL MOUNT
DETAIL VIEW



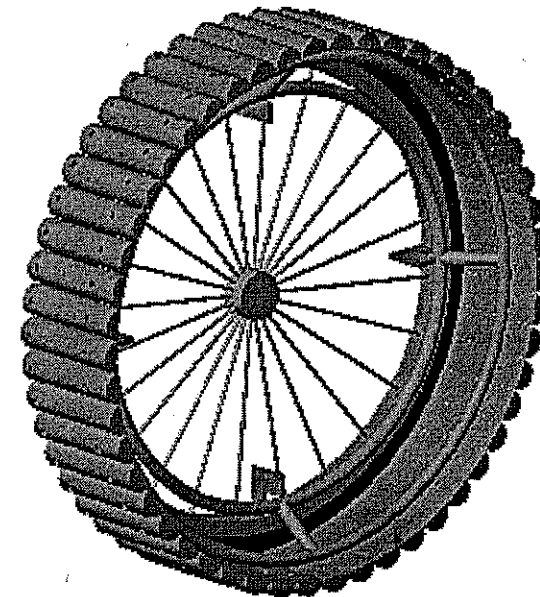
Diagrammatical Representation of Wheelchair Conversion with Beach Retrofit Kit.



The above picture shows the original wheel before the Beach Retrofit Kit is installed. The handwheel anchor points are used by the support ring as attachment points.



This picture shows the support ring installed on the original handwheel. The spacers between the handwheel and the support ring are welded onto the ring and fit onto the handwheel by means of slots. Snap-lock clamps ensure a secure fastening, which is at the same time easy to install and remove.



Here the rib-mat is seen installed on the wheelchair wheel and the support ring. Loading on the rib-mat is distributed back to the handwheel anchor points and onto the wheel. The aluminium and nylon construction would enable the wheelchair to negotiate water, if it itself was corrosion resistant.

Concept Solution

The solution proposed uses a segmented track wrapped around the rear wheels, thus increasing the surface area of the wheel in contact with the sand.

How it Works

1. The two tracks are unrolled and placed on the ground
2. The wheelchair is then placed on top of the track so that the rear wheels sit into the locating groove (Figure 1)
3. The track ends are then lifted up and wrapped around the wheels (Figure 2)
4. The locking pin is inserted joining the two ends of the track forming a continuous loop around the wheel (Figure 3)
5. The wheelchair can now be used on soft ground. The caregiver will need to push the wheelchair around while on soft ground since the front wheels will still tend to sink into the sand.

When not in use the tracks roll up into a compact size. (Figure 4)

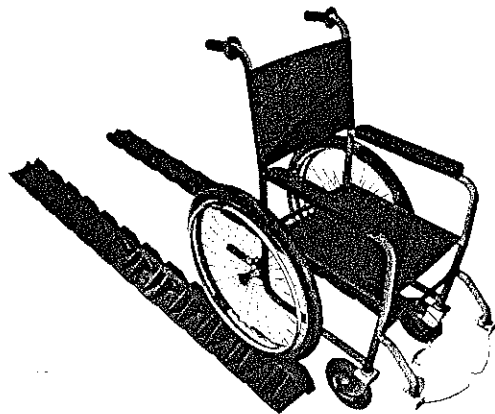


Figure 1 – Tracks laid out on ground

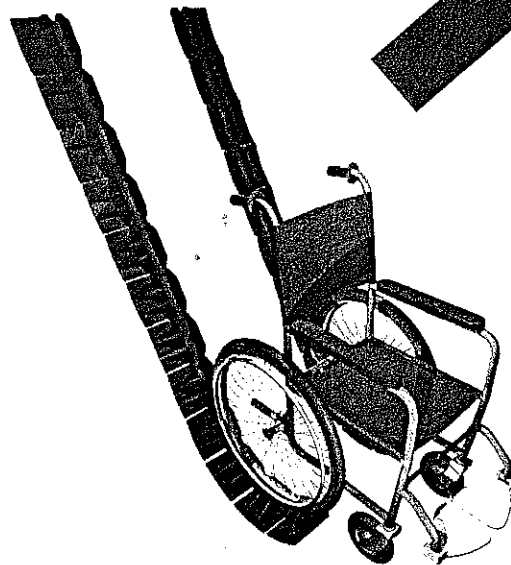
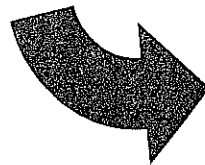


Figure 2 – Wrapping tracks around wheels

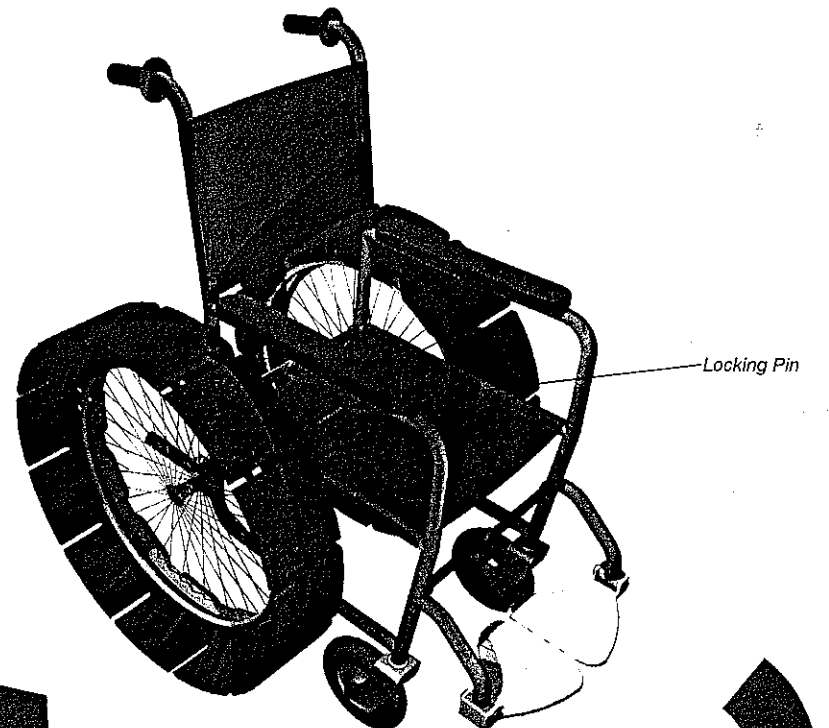


Figure 3 – Tracks fully wrapped around wheels

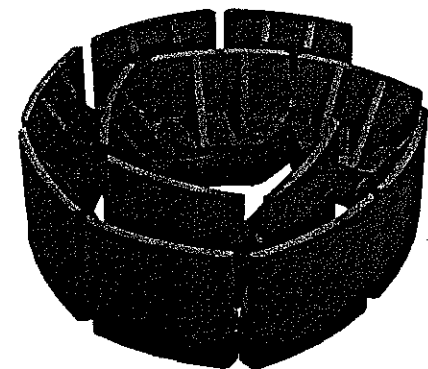
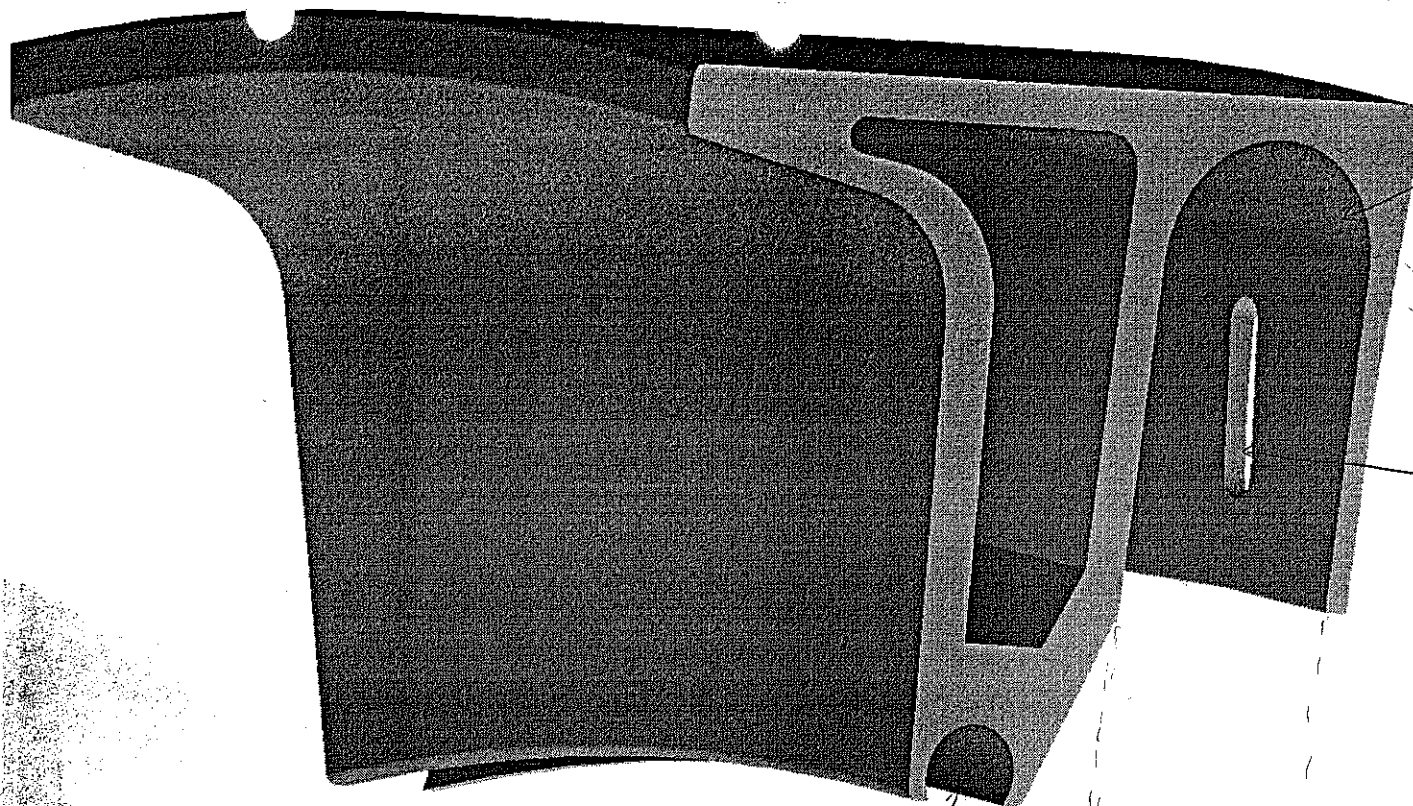


Figure 4 – Tracks rolled up for storage

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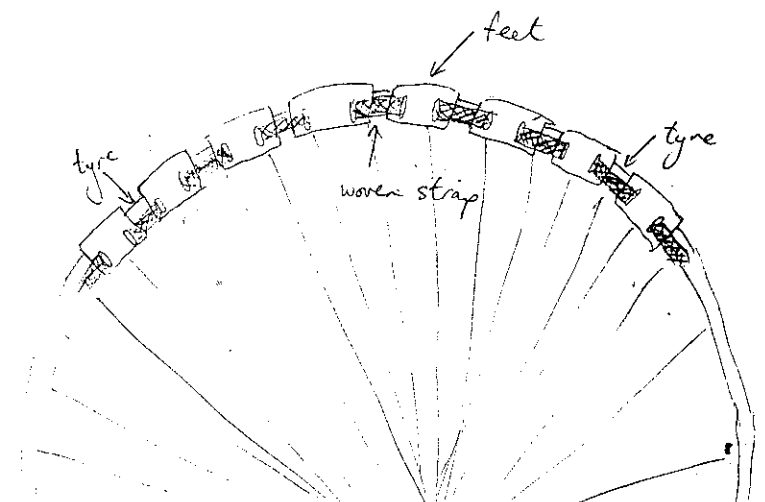
Cutout to fit wheelchair tyre

Hole to thread woven strap through

Cutout to fit wheelchair wheel handrail

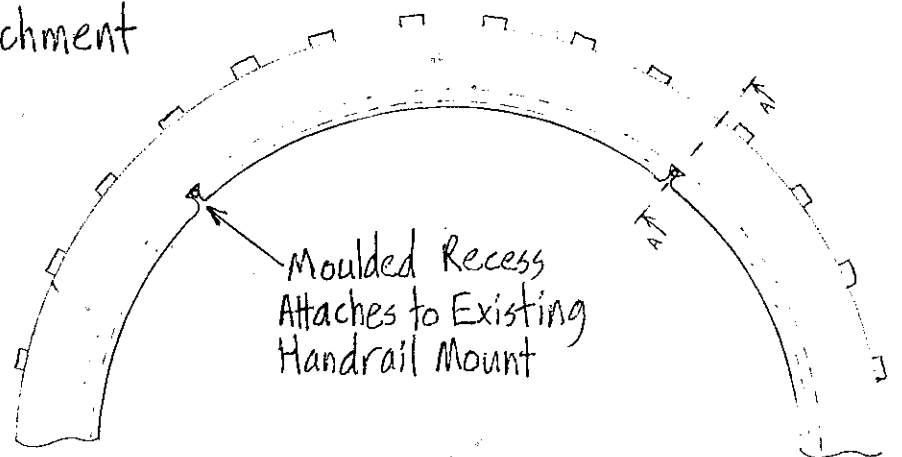
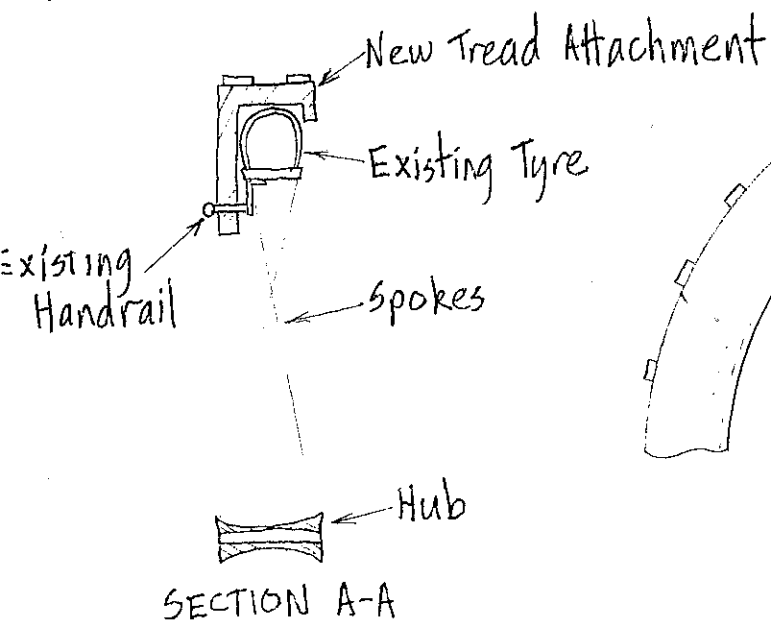
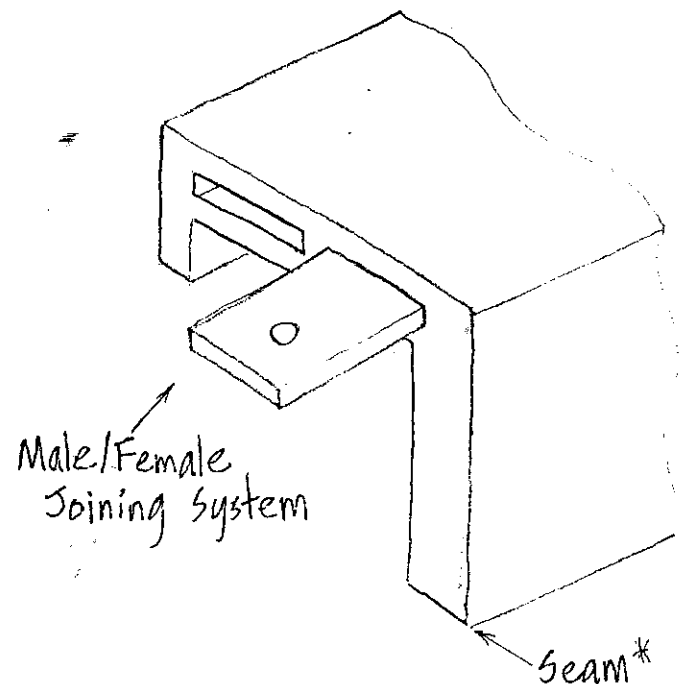
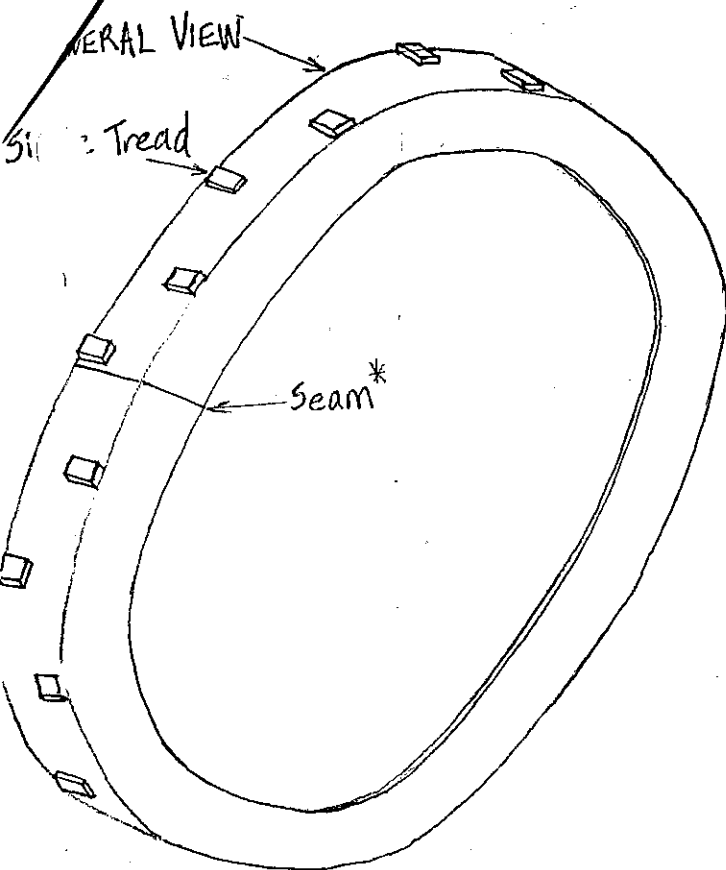
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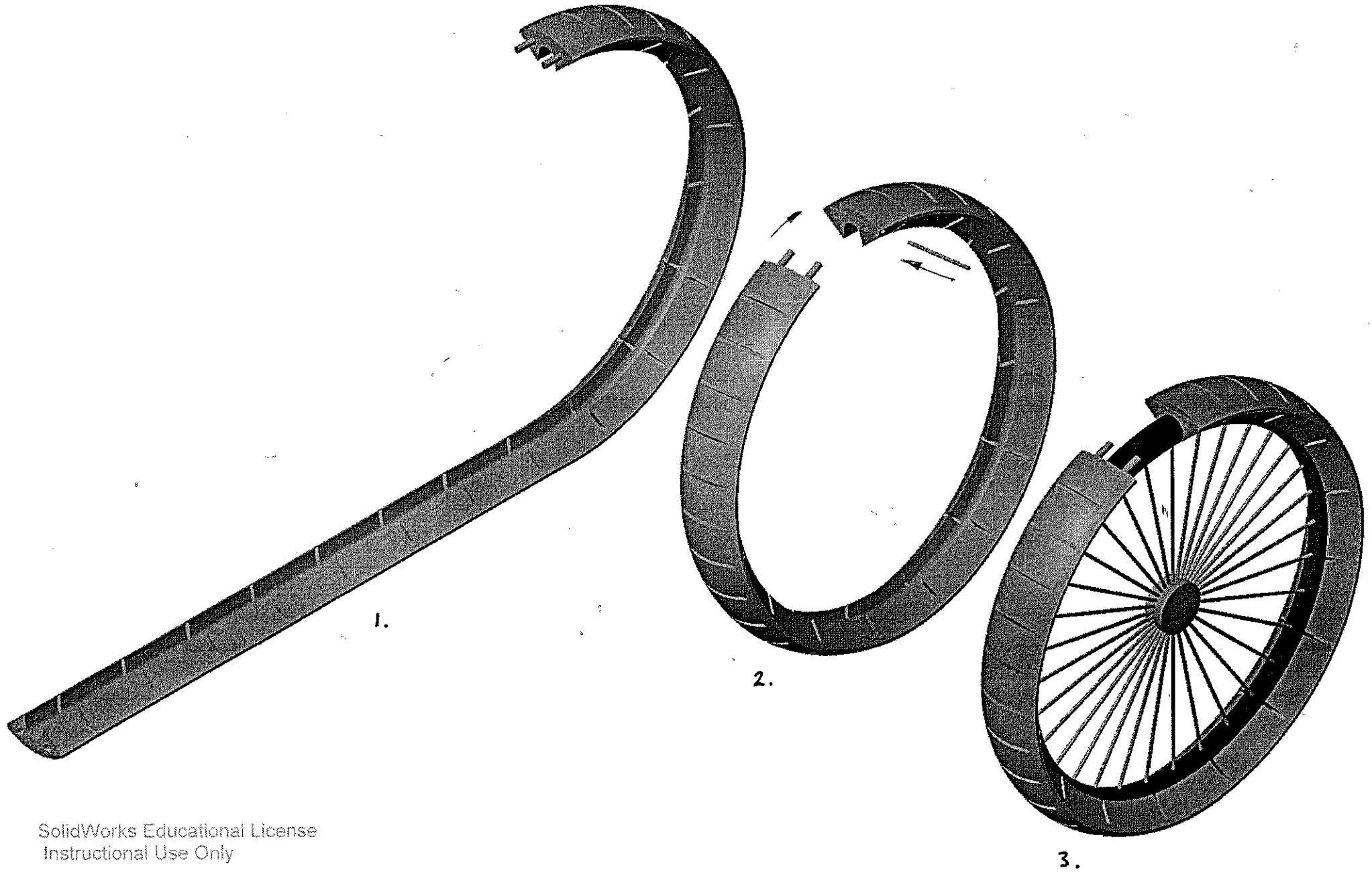
Example of wheel:

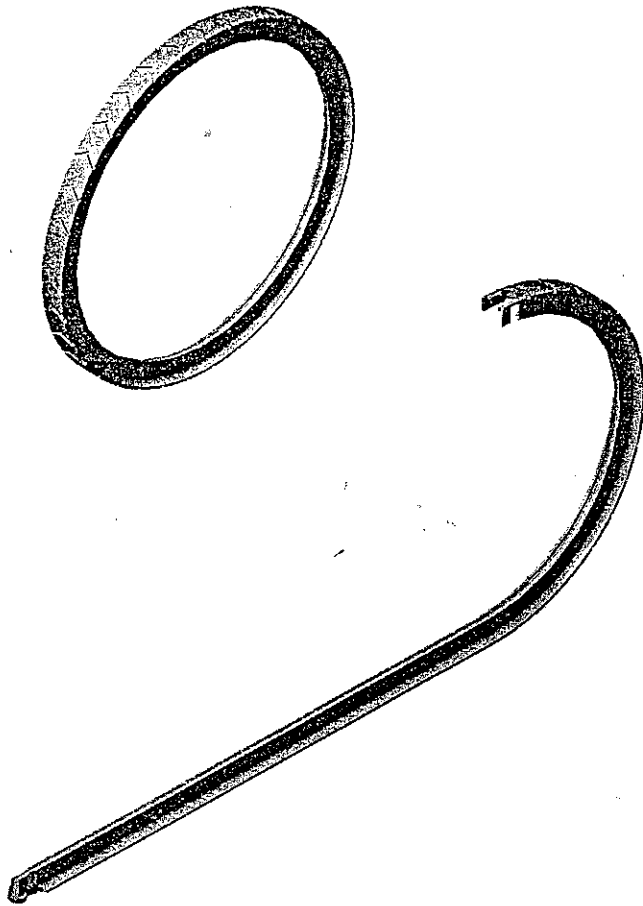


CONCEPT: Rear Wheel Assembly

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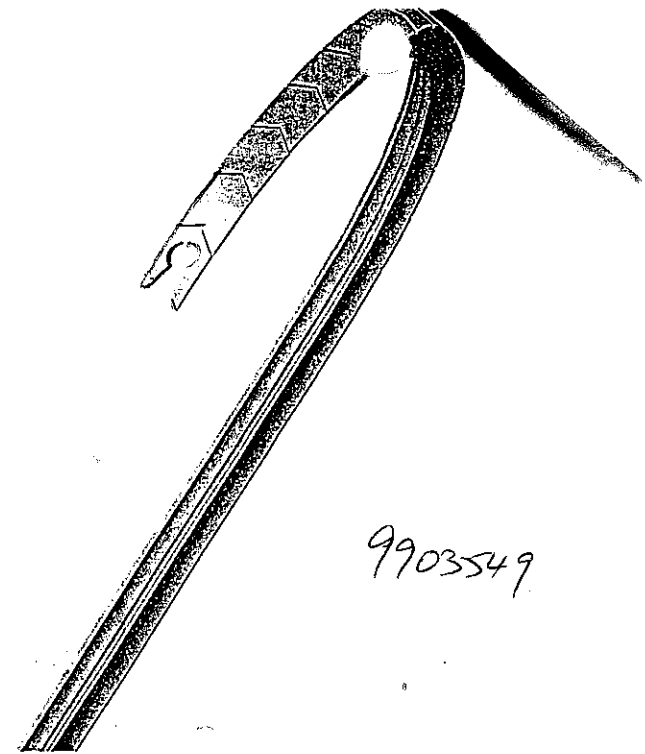




Isometric View.

Showing a closed version, and also an open one. Note the tab at the lower end and the matching cut away at the other, used to secure the device once around the wheel.

Cross section
View ?



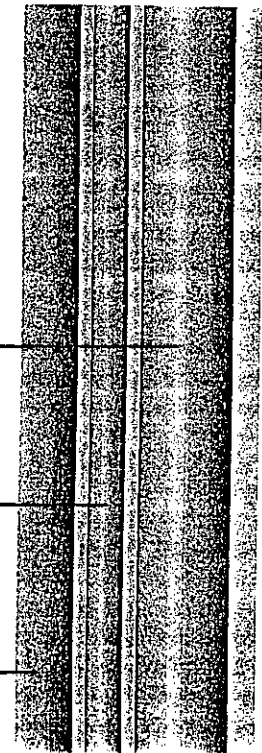
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Top View of the Inner
Side of the Plastic
Fitting

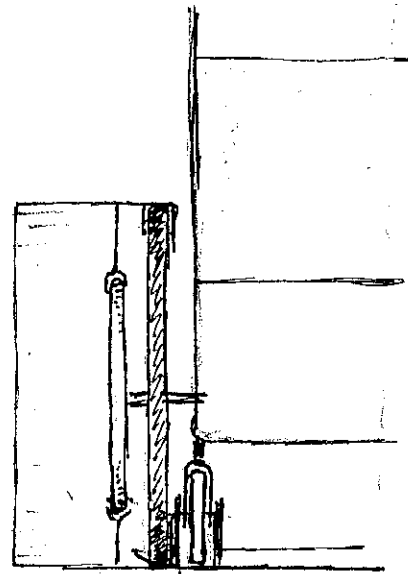
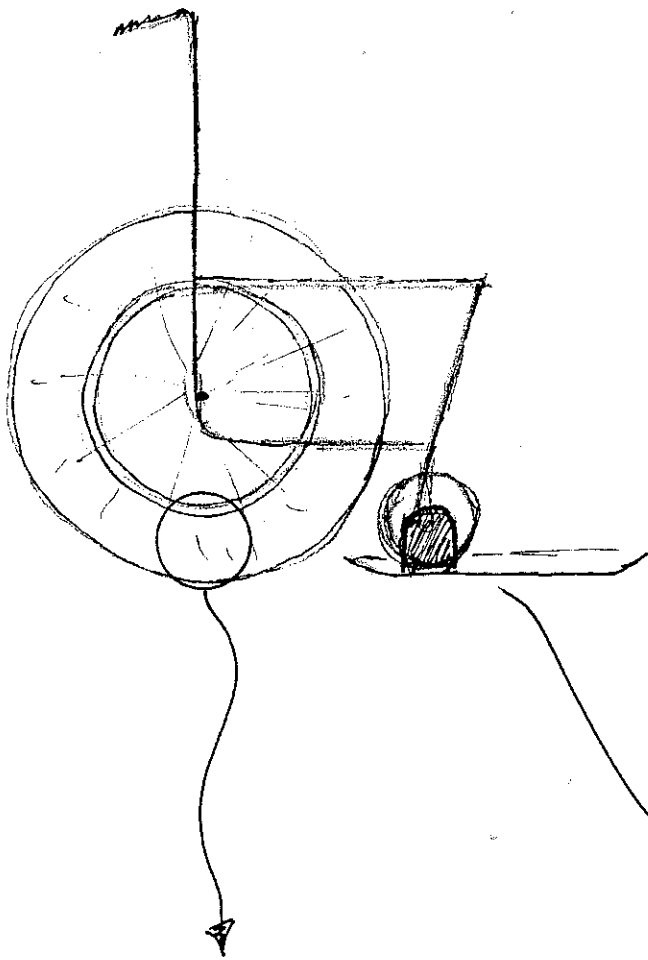
Formed hollow that
holds the wheel.

Formed hollow that
holds the handrail

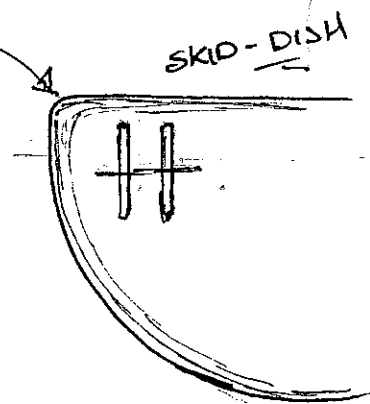
Outer lip, for
possible patient use



9814498

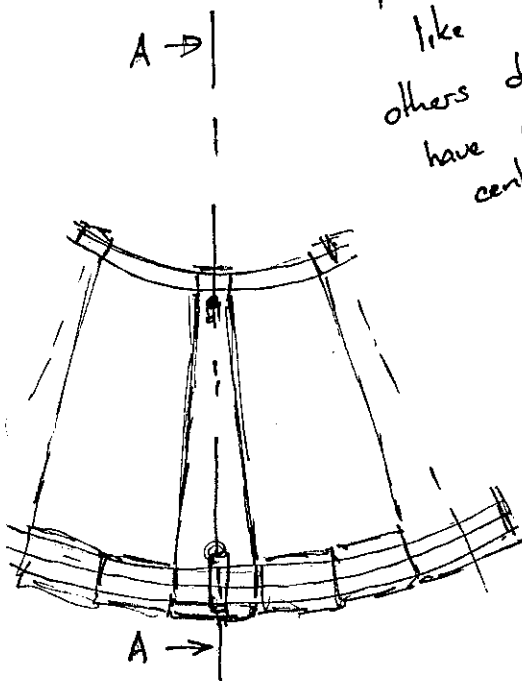


attach to wheel at pivot

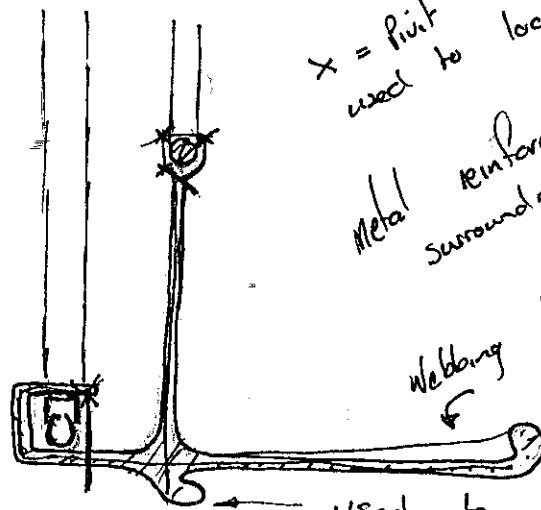


only every third
like this
others do not
have arm to the
centre.

section AA



X = Pivot
used to lock on the back.
Metal reinforcing in red
surrounded by rubber.



Webbing for reinforcement

used to move or for on holder

low contact, less contact, less

9958174

Figure 1 Front Wheel (axle omitted for clarity)

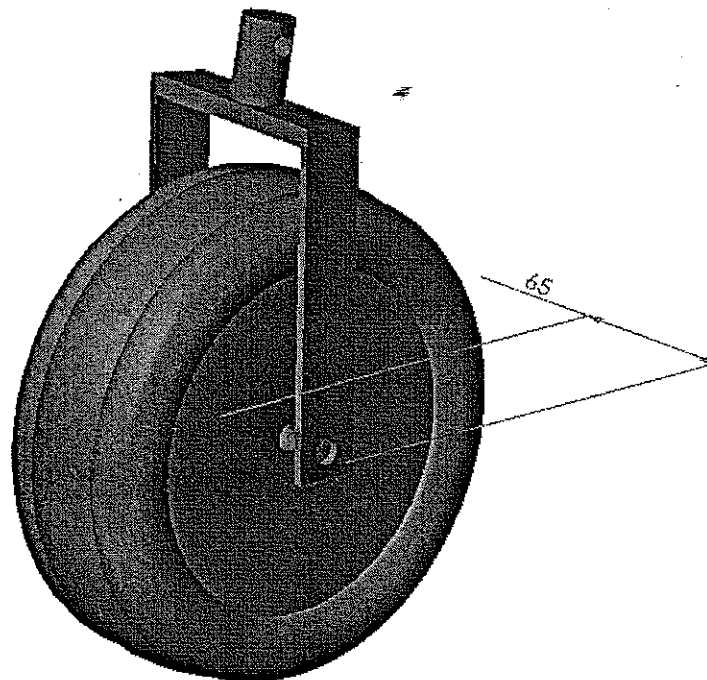
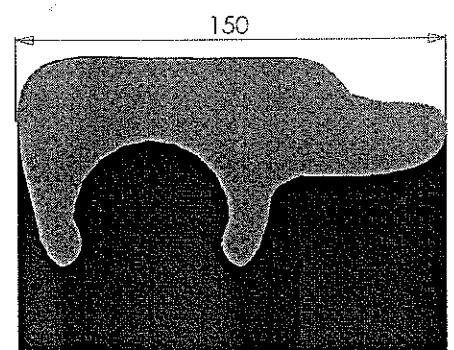


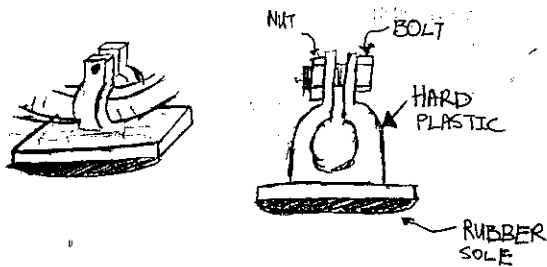
Figure 2 Rear Attachment
Insert Cross section



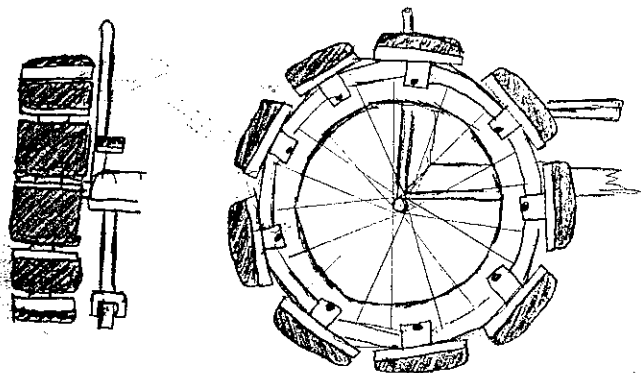
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REAR WHEEL CATAPULT TRACKS

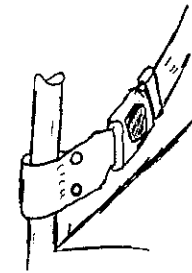
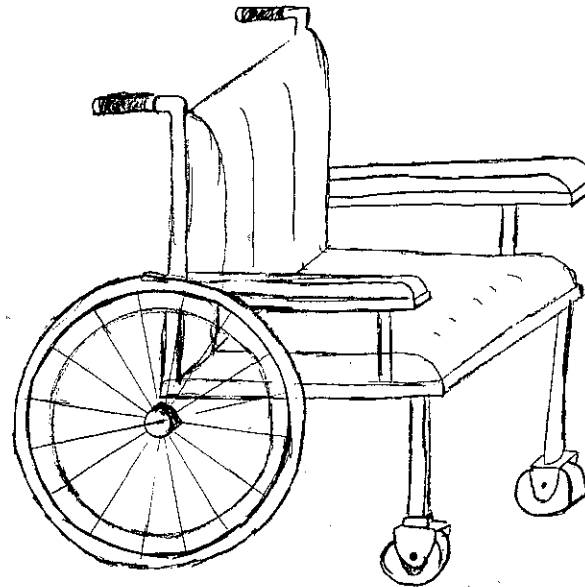
EACH SECTION OF TRACK IS MUCH WIDER THAN THE ORIGINAL WHEEL. THE GREATER SURFACE AREA IN CONTACT WITH THE SAND MEANS THAT THE CHAIR SHOULDN'T SINK INTO THE SAND. EACH SECTION IS ATTACHED BY A NUT AND BOLT AS SHOWN. THE RUBBER SOLE GIVES TRACTION IN THE SAND.



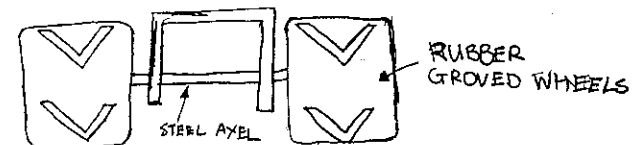
TRACKS ONCE ATTACHED



ORIGINAL CHAIR DESIGN



LAPBELT: AS THE TERRAIN ON SOME BEACHES IS RUGGED AND BUMPY A CAR SEATBELT IS AN ADDED SAFETY PRECAUTION



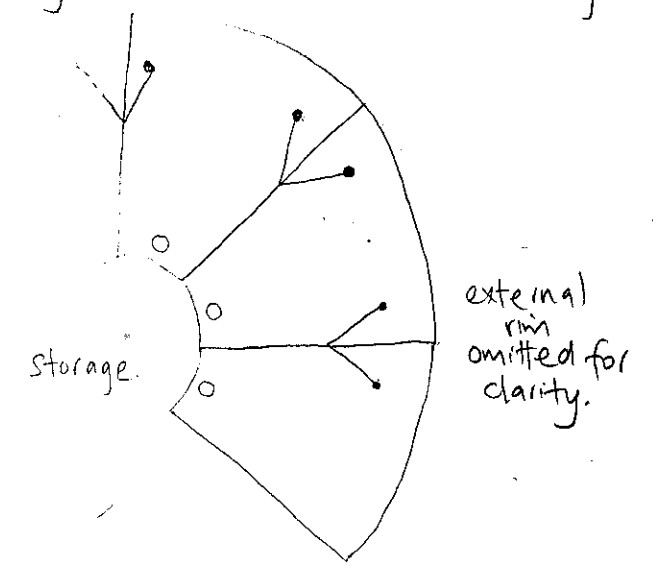
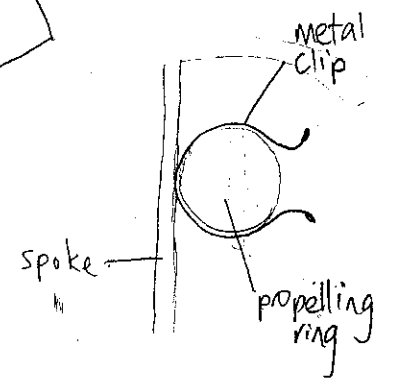
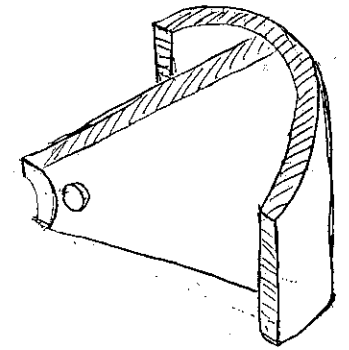
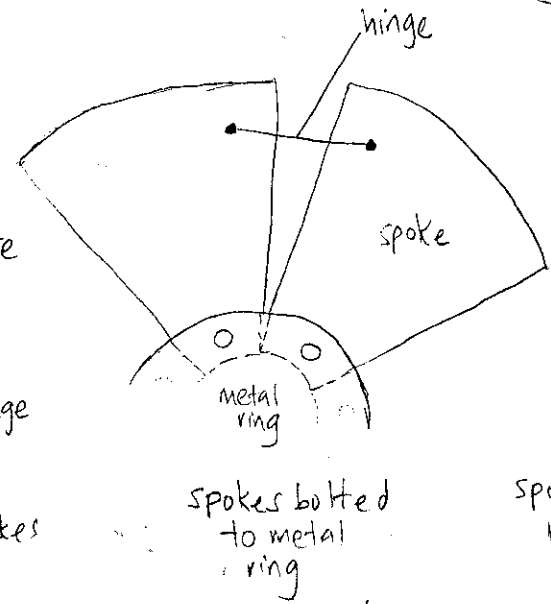
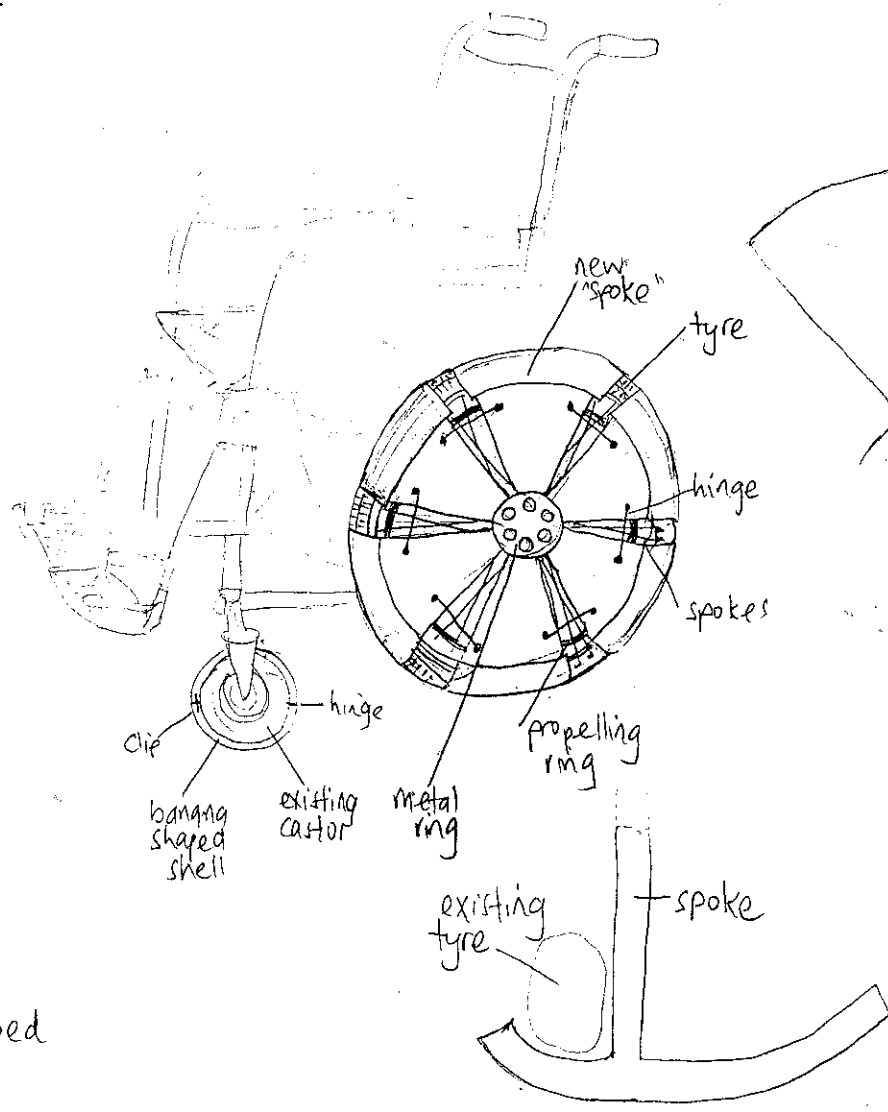
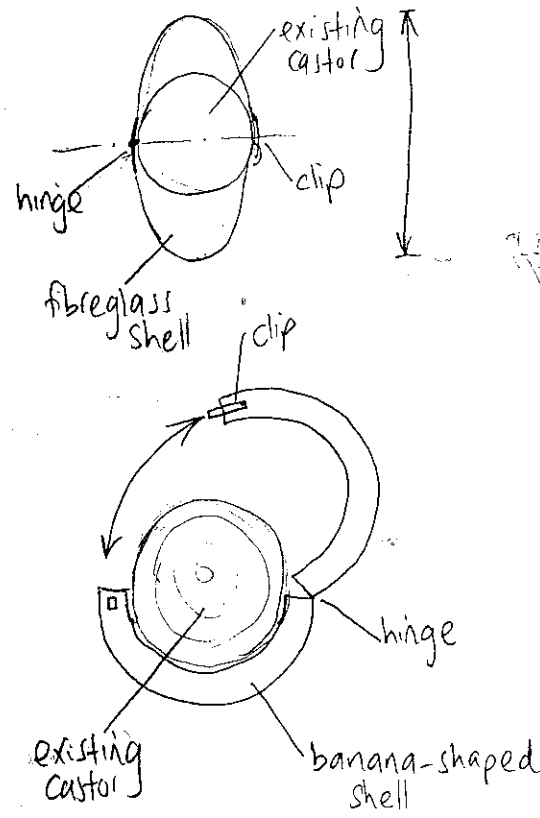
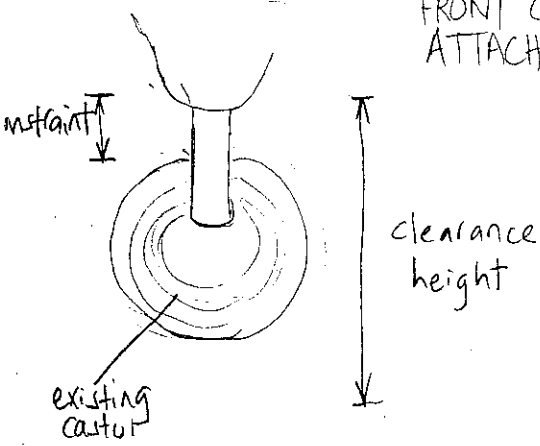
FRONT WHEELS: LONG AXEL PUSHED THROUGH FRONT WHEEL FORK THIS MEANS FOUR FRONT WHEELS. THE NEW WHEELS ARE MUCH FATTER SO THEY SHOULDN'T GET STUCK IN THE SAND, THEY ALSO HAVE V-SHAPED RIDGES WHICH WILL GIVE THEM EXTRA TRACTION. THE NEW FRONT WHEELS ARE LARGER THAN THE OLD ONES, THIS IS TO COUNTERACT THE FACT THAT THE REAR WHEELS ARE LARGER. THUS MAKING THE CHAIR LEVEL AGAIN.

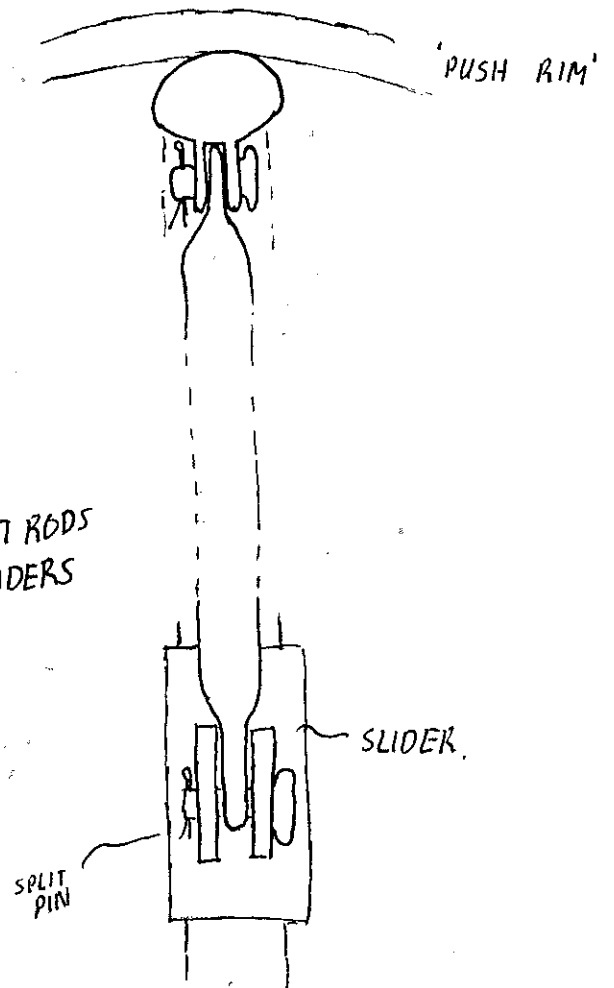
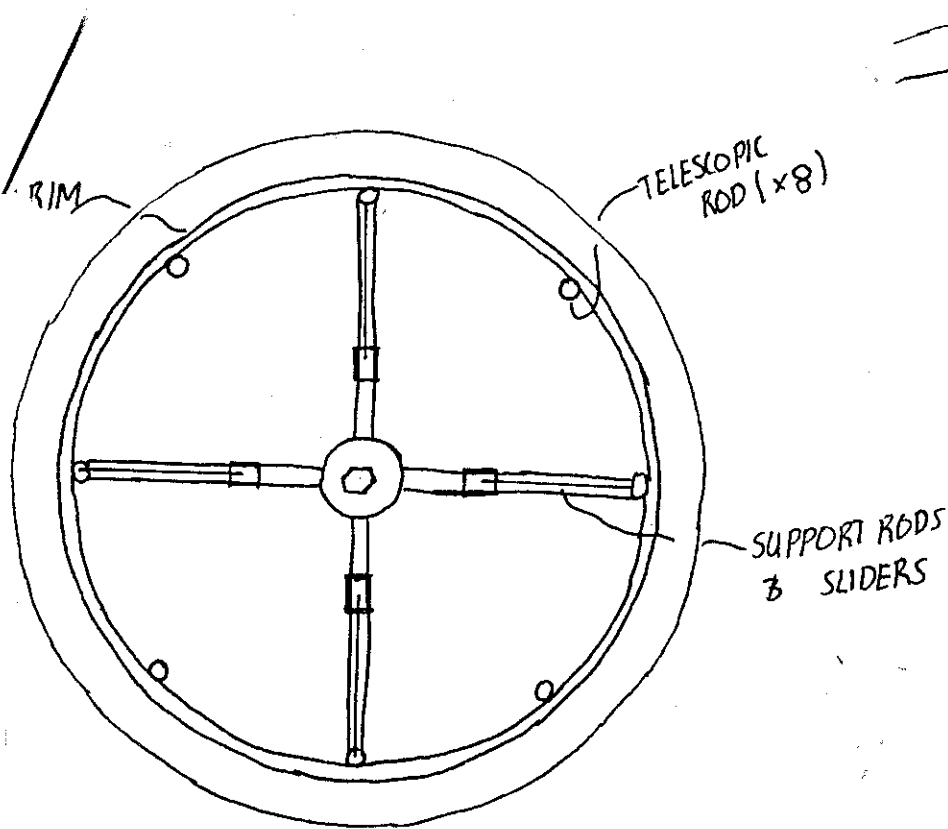
BEACH RETROFIT KIT

9830273

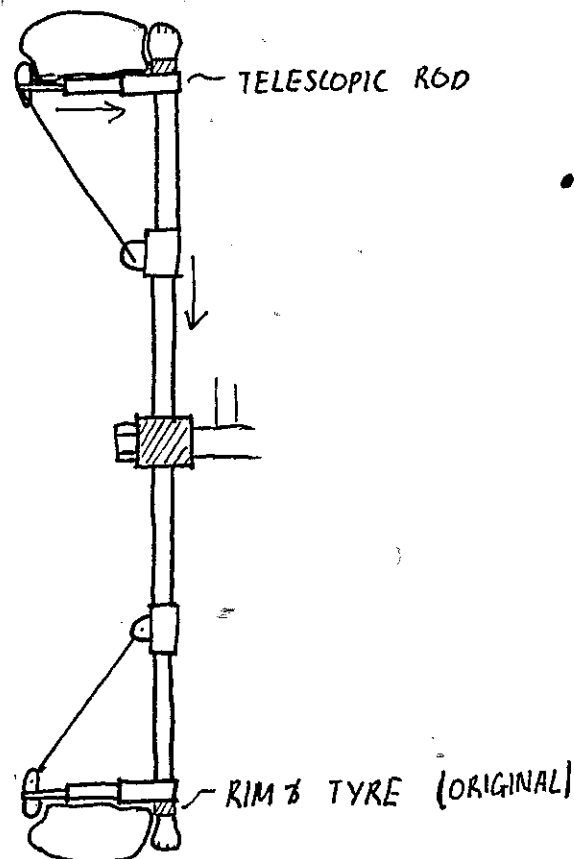
FRONT CASTOR
ATTACHMENT

REAR WHEEL
ATTACHMENT.





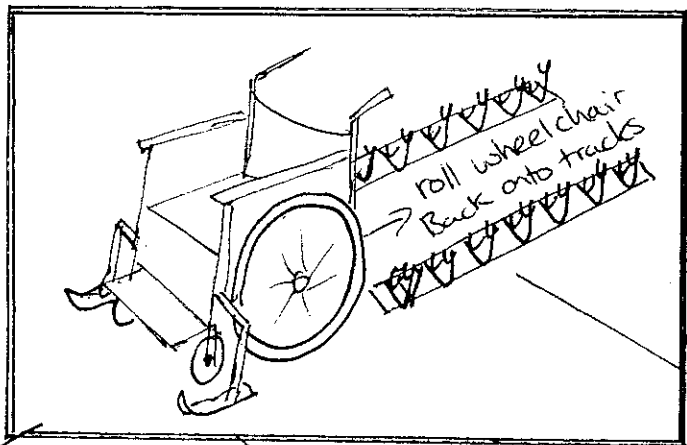
SECTION VIEW OF WHEEL
(TUBE INFLATED)



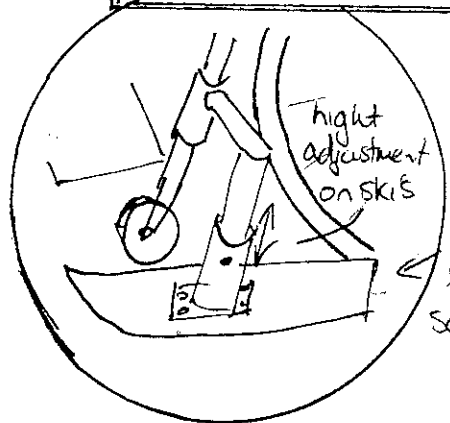
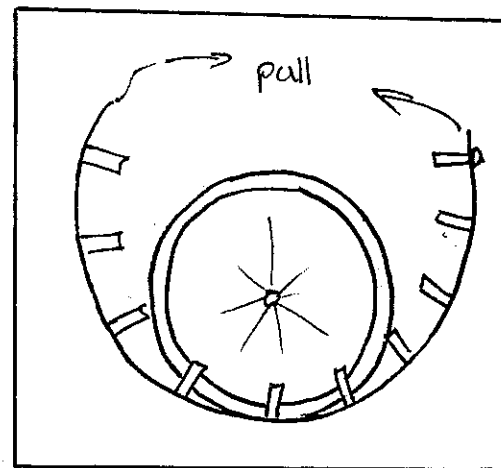
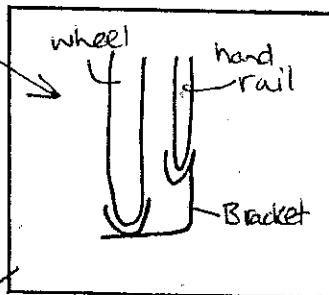
- SLIDER ABLE TO BE LOCKED IN PLACE BY LOCKING SCREW (INCREASE FRICTION ON SPOKE)
- DEFLATED TUBE STORED BETWEEN TYRE & 'PUSH-RIM'

9807883

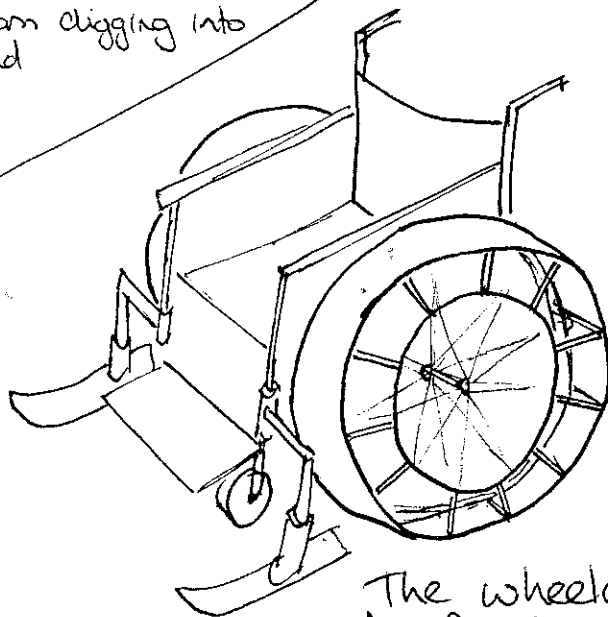
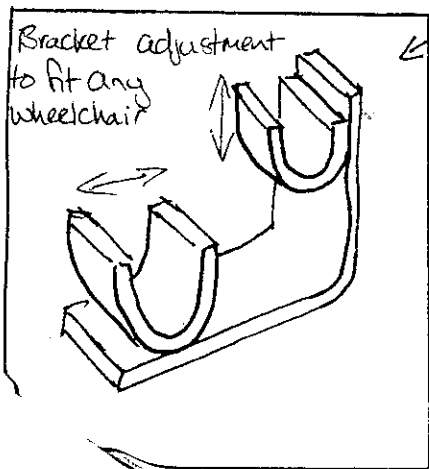
INFLATED TUBE



align tracks with
wheel like this



front ski's
stop front wheel
from digging into
sand



The wheelchair
ready for the beach

