Multi-Functional Collision Avoidance Helmet

This invention is a new helmet that helps to prevent collisions and records traffic incidents.

Mary Kies, an avid bike rider, would often get in various collisions when biking. So, Mary came up with an idea to prevent these types of accidents from occurring. She called her idea a *Pre-Collision Camera System for Personal Riding Vehicles*.

She realized that she would need to protect her idea, so she needed to get a patent. Mary remembered attending an Outreach Event sponsored by the USPTO where it was suggested to find a registered patent practitioner at the USPTO.GOV website. She chose Pat N. Turney and proceeded to his law office.

Mary Kies arrived at Mr. Turney's office and began to explain how she came up with this invention and wanted to get a patent.

Mary began by explaining why this invention was needed. She indicated that while riding through the hills of West Virginia, unbeknown to her, a bear was running behind her. She indicated that she was shocked and terrified that she did not know a bear was behind her. So, that is why she felt a need for some type of detection system that would alert her if something was coming up on her too quickly. Pat N. Turney thought this idea was great and planned to file a patent application with the USPTO as soon as possible.

Mary Kies described the invention to Pat N. Turney as follows:

My idea is to have a pre-collision camera system for all of my personal riding vehicles. It would have one rear and front-facing camera which includes a detection device for recognizing the position and speed of an impending entity.

My detection device is a wireless audio/video camera system. The system interfaces with a mobile communication device. My graphical user interface will provide GPS, Bluetooth, Wi-Fi, warnings, notices, pop-ups, panic button and other features to enhance smart phone capabilities that will improve object detection and location. Speed of the wearer and the speed of objects moving near the wearer can be displayed to the user and if someone is heading toward an imminent collision, the wearer can be warned. If the collision occurs, it will automatically send warnings to emergency services and designated personal contacts which include GPS coordinates.

The device will include a rechargeable battery with CPU(s), GPU(s), Qi wireless charging and memory to store audio/visual images. The cameras will need image stabilization and each camera will have a 180 degree or more wide-angle view that overlaps with the other cameras so that a full picture of an event can be captured.

The interface includes capabilities for engaging the electronic power assist to increase the speed of the personal vehicle, such as a bicycle, scooter, skate board, hover boards, jet ski, mountain climbing, skiing, etc. The gears of the vehicle or bicycle can be engaged to either slow down or to speed up when something is approaching quickly from behind when there is z power assist mechanism on the vehicle. The collision system and sensors can engage brakes on the vehicle when an object is about to collide with the wearer, to avoid an accident if the wearer is not paying attention.

Also, every sport has a different type of helmet. In one embodiment, a harness can include an LED. The helmet can include an impact sensor if enabled will call 911 or designated emergency contacts through a mobile device with GPS coordinates, personal identifying information of the user, and a snapshot/picture. The camera and the microphone and speakers can be set to auto answer a call or to make a call through a mobile device wirelessly using Bluetooth, Wi-Fi, a cellular signal. The signals can also detect these same signals to help determine closeness of other objects and can send signals through those other devices if necessary to determine a location and send for help. A light that can flash and light up in different colors to either attract attention for an emergency or to avoid a collision at night is also included in one embodiment. Each camera will have a sensor and a light that can use to illuminate the area for a picture like a flash or as an alert. Potholes in the street can also be avoided by the device sensing a pothole and reported pothole, ice, and traffic information can be displayed along with GPS directions to take a particular route. The system is waterproof and impact resistant. The vehicle, such as a bicycle will have the option of mounting a display or mobile device with an interface to operate the collision system.

This will prevent attacking animals and vehicles from getting too close by warning detections to provide evasive maneuvers to avoid injuries.

The cameras will record audio and video with infrared night vision. The camera will take a 360-degree picture that will show what is going on in all directions at one time with 3D as an option to view on a virtual reality headset or screen. Any collision or possible collision will be recorded with timestamp data and weather condition data. Will be admissible in a legal court proceeding, insurance or police investigation, if necessary. The camera recording will include GPS coordinates in real-time, time, speed, altitude, and other relevant metadata. Fitness data can also be measured and captured such as metabolism heart rate, oxygen rate, etc. Rain and

threatening localized weather in the vicinity can also provide alerts, giving time to take cover, so the user is not caught in a storm.

The camera can be engaged through the interface device or through the microphone by saying a predetermined keyword or words like, “selfie,” “gnarly dude,” “snap,” “take a picture,” “take a video,” “send help,” etc. The device can be trained for a particular action based on keywords. There could be a time delay to snap the picture either through a keyword or keywords or the user interface. There can also be modes to constantly record, to over-write old records when space is needed. A mobile device’s storage can also be used to store data wirelessly. Alternatively, data can be backed up through the cloud over a wireless signal or downloaded to a computer or hard drive or other external storage devices.

The system will have an altimeter to measure height when used with mountain climbing or doing flips on a bicycle or other vehicle, and will be able to post a video to Instagram, Facebook, or other social media immediately using the interface.

Figure 1 is the first embodiment showing a complete one unit helmet system with four 180 degree wide angle cameras a strap with a user wearing the helmet.

Figure 2 is a side view of Figure 1, which also shows a microphone/speaker.

Figure 3 is a top view of the helmet.

Figure 4 shows a helmet with a replaceable shell so that different types of helmet tops (for various sports) can be substituted while the base remains with all systems incorporated within the base. Figure 4 has a detachable cover (shell), biometric sensors; cameras; protective foam insulation.

Figure 5 shows the wireless connections of the cameras and biometric sensor to a user interface (mobile device, display, etc.).

Figure 6 is a blown-up version of from the front of the helmet shown in Figure 4. Figure 6 shows each camera will have a light, distance sensor, microphone/speaker.

Figure 7 shows the covers for the cameras and the shell covering since the cameras will be on the base and attachments of velcro-like connection device. The base has all of the electrical devices incorporated therein.

Figure 8 is an embodiment of an adjustable strap that can be placed on various types of helmets having the entire system incorporated in the helmet strap with cameras, lights, and all the devices from Figure 6.

Figure 9 is a separate embodiment of a strap with the cameras all on top with straps to place the unit on any helmet with all of the devices from Figure 6.

Figure 10 shows the device in operation when an object from the rear is rapidly approaching having alerted the rider to take evasive maneuvers having seen the object in the user interface of Figure 11.

Figure 12 shows the electric circuitry of the unit.

Figure 13 shows an electric pedal-assisted bicycle with a power supply and user interface attached which can be optionally engaged to *brake or power to help* maneuver in various situations, however, the device is for any sport.

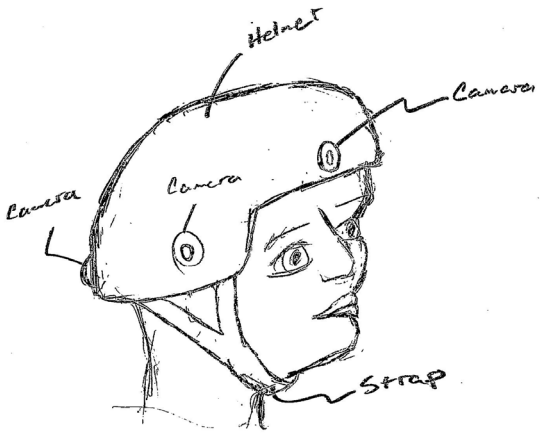


Fig. 1

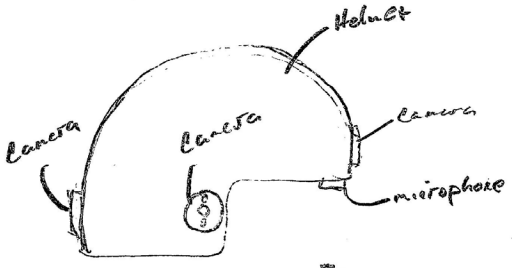


Fig-2

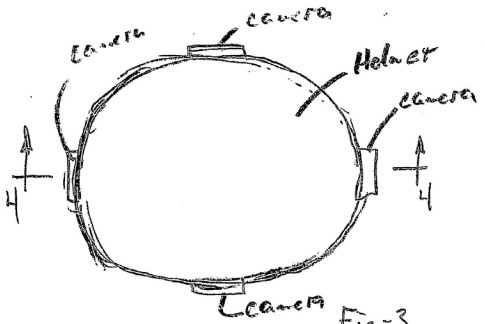


Fig-3.

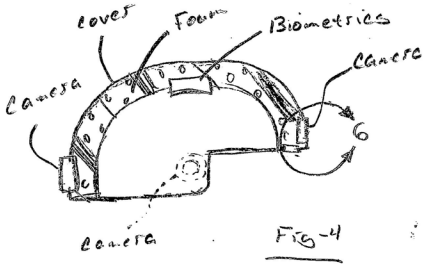


Fig-4

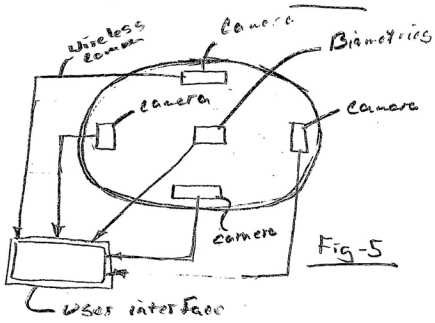


Fig-5

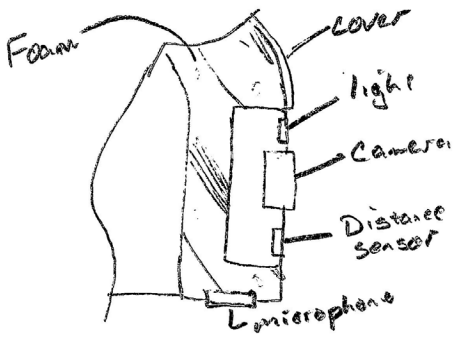


Fig-6

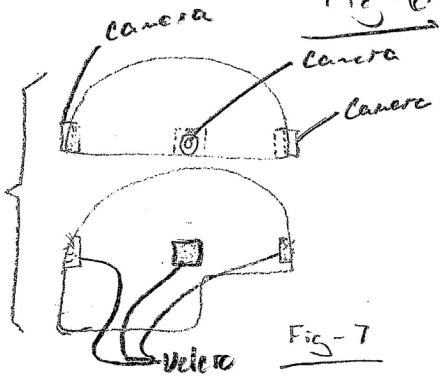


Fig-7

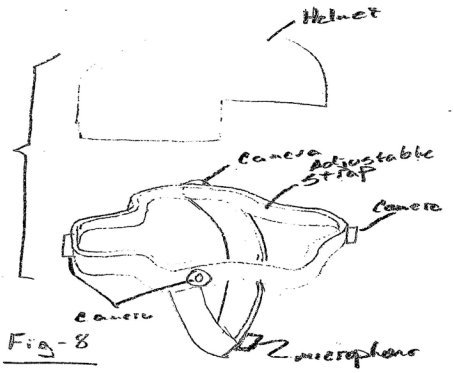
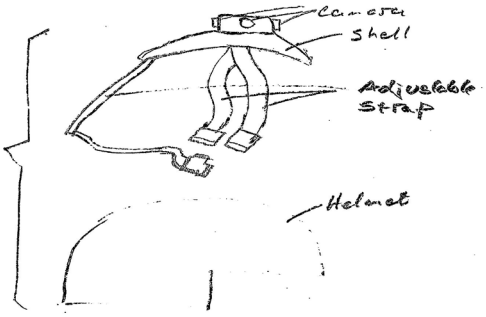


Fig-8

Fig-9



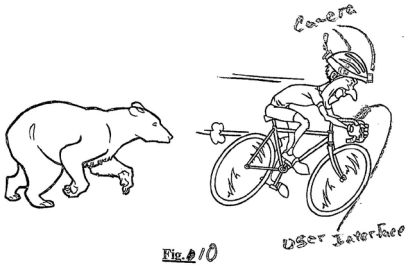


Fig. #10

Fig. #11

User Interface

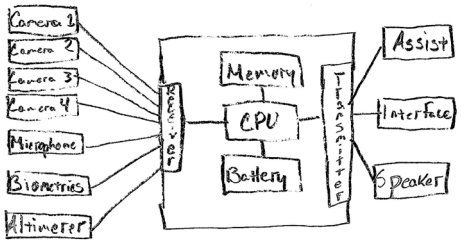


Fig-12

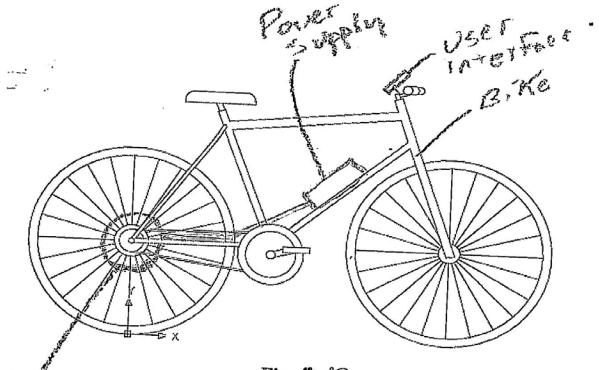


Fig. #13

Power Assist/Brake Info.

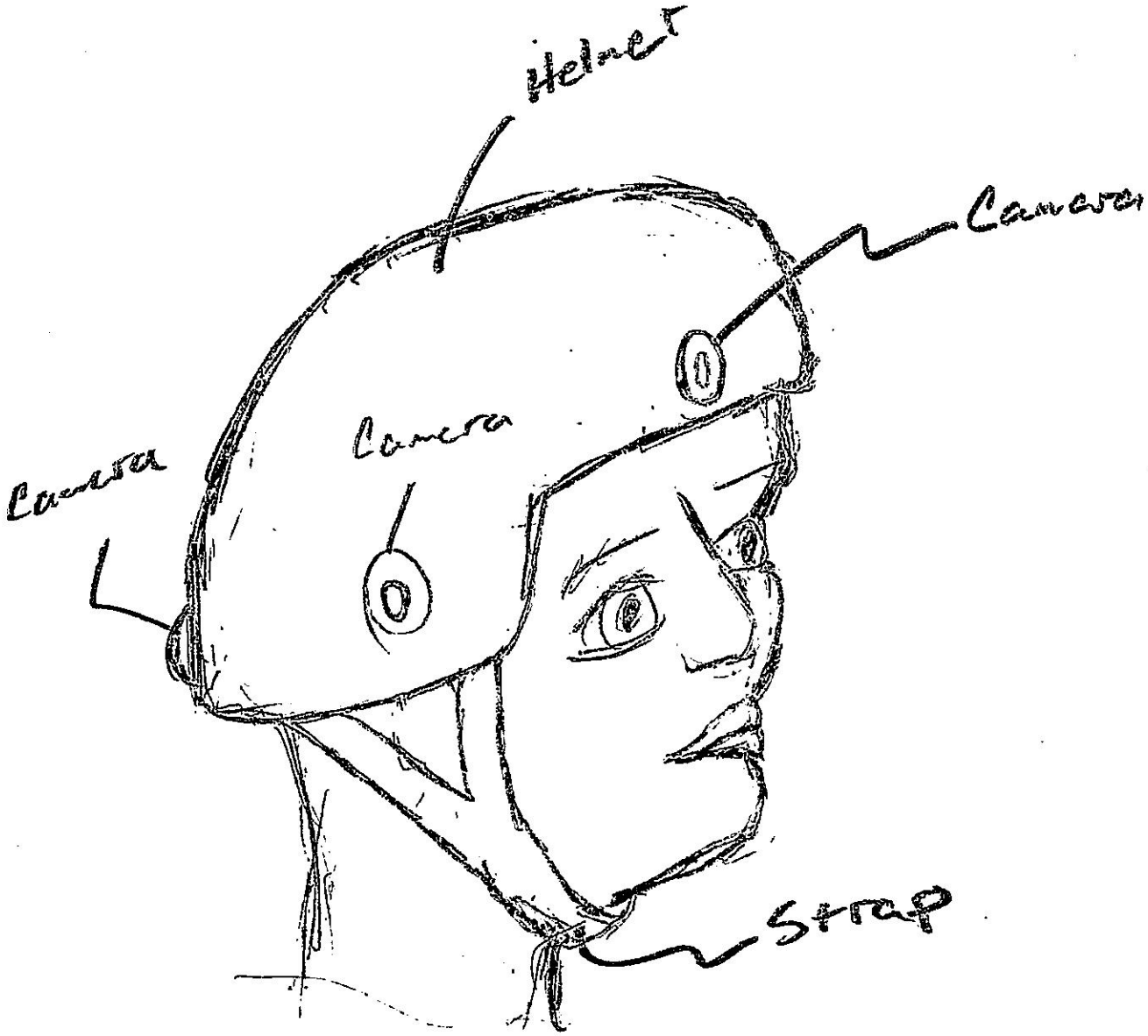


Fig. 1

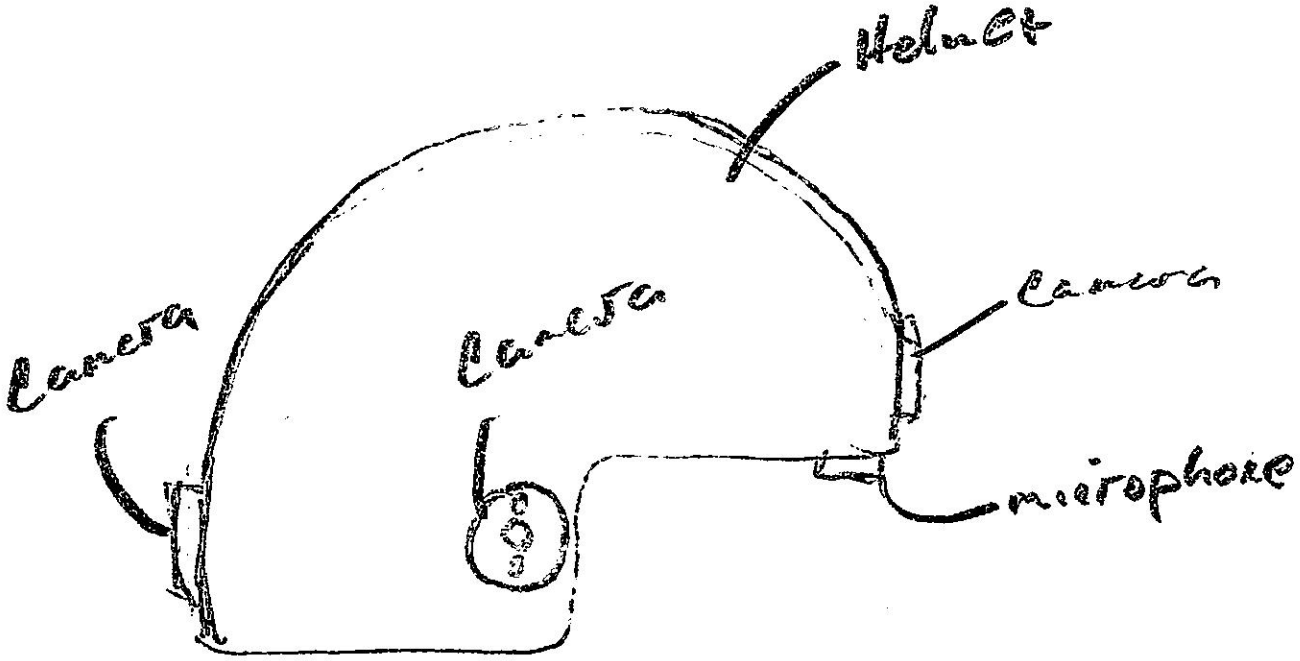

Helmet
camera
camera
camera
microphone

Fig-2

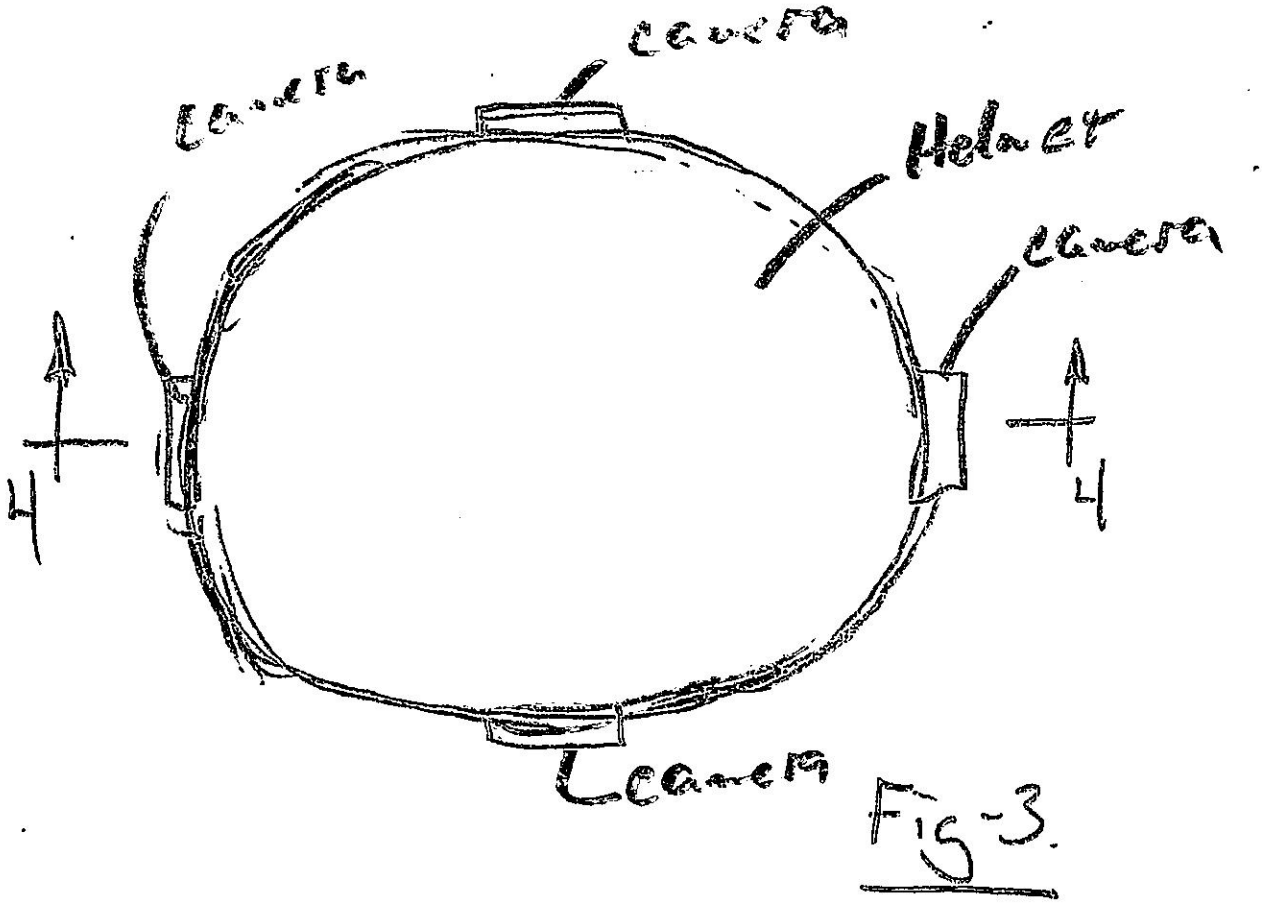

camera
camera
Helmet
camera
camera

Fig-3

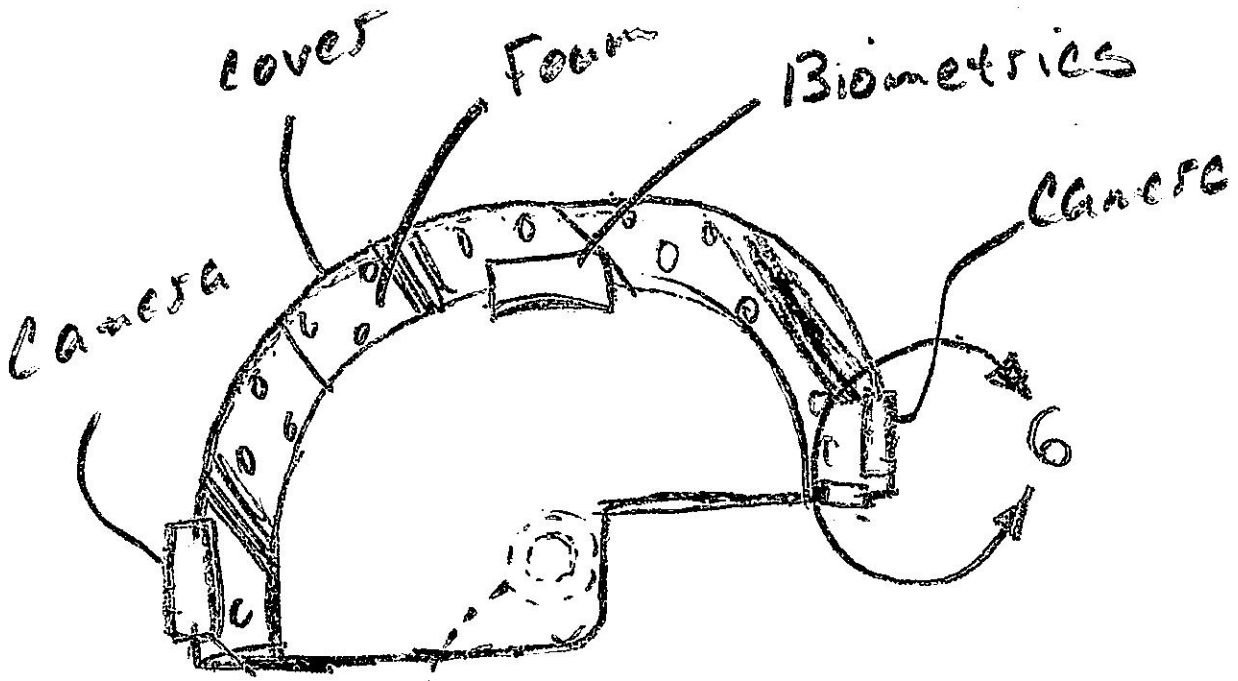

Cover
Foam
Biometrics
Camera
Camera
Camera
6
Camera

Fig-4

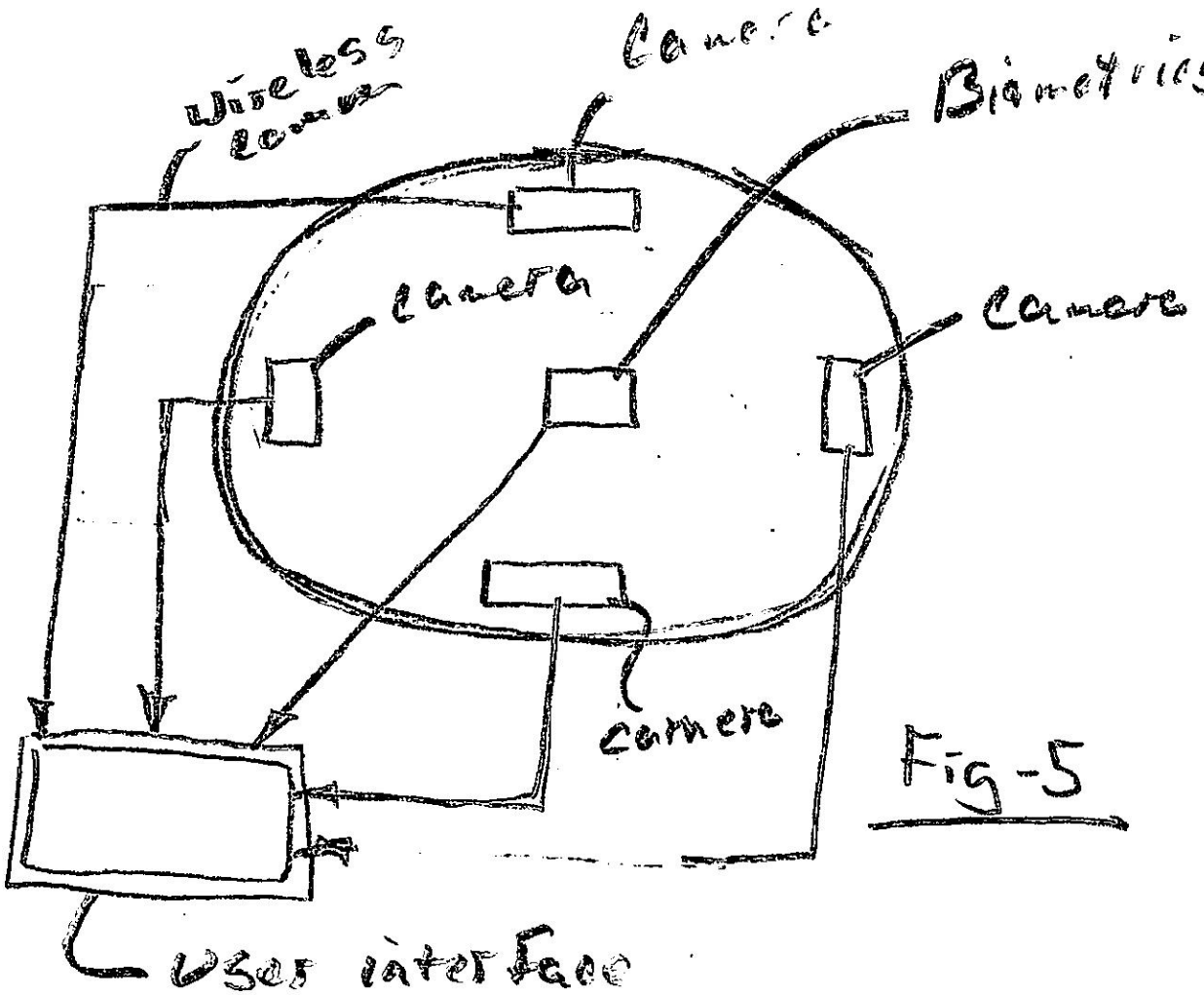

Wireless camera
Camera
Biometrics
Camera
Camera
Camera
User interface

Fig-5

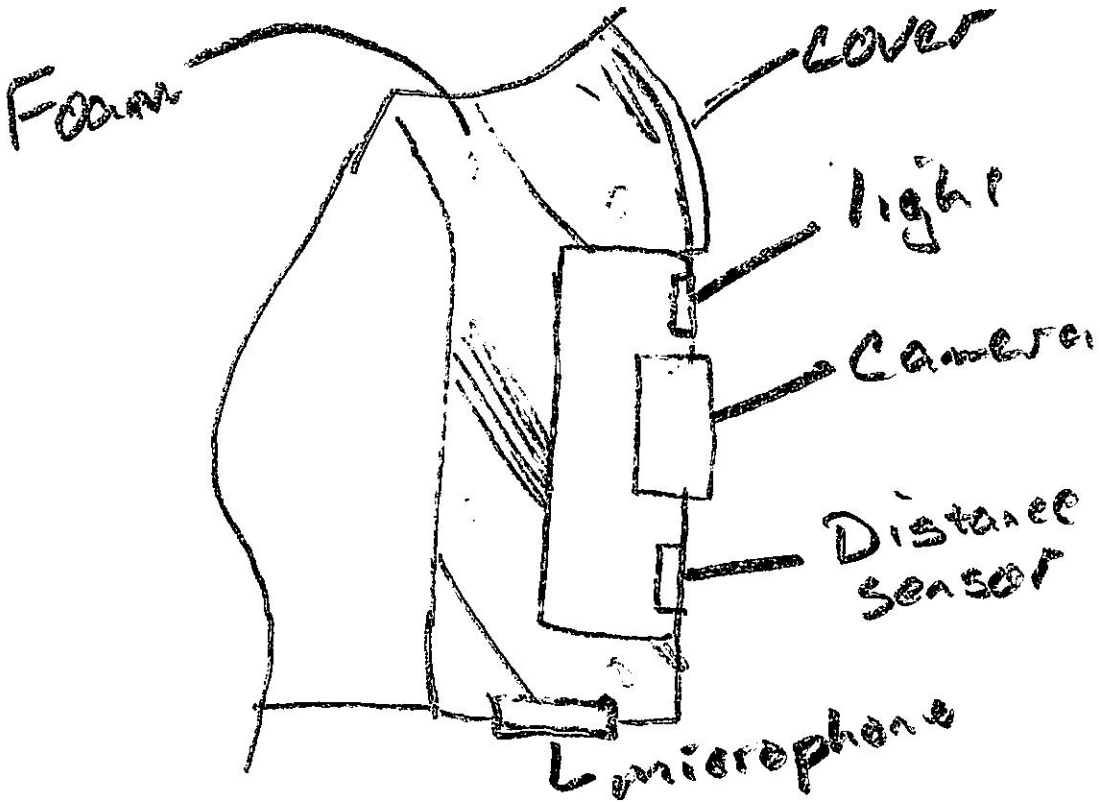

Foam
Cover
light
Camera
Distance
sensor
Microphone

Fig-6

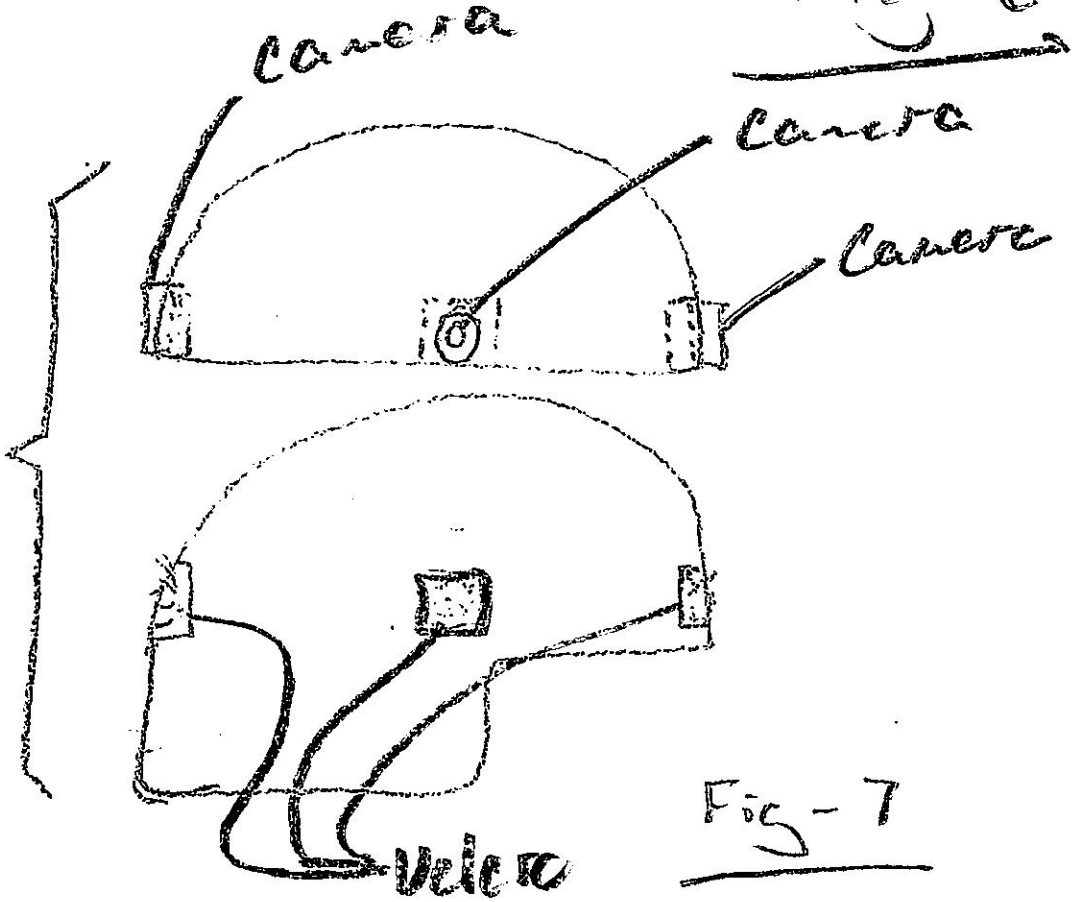

Camera
Camera
Camera
Velcro

Fig-7

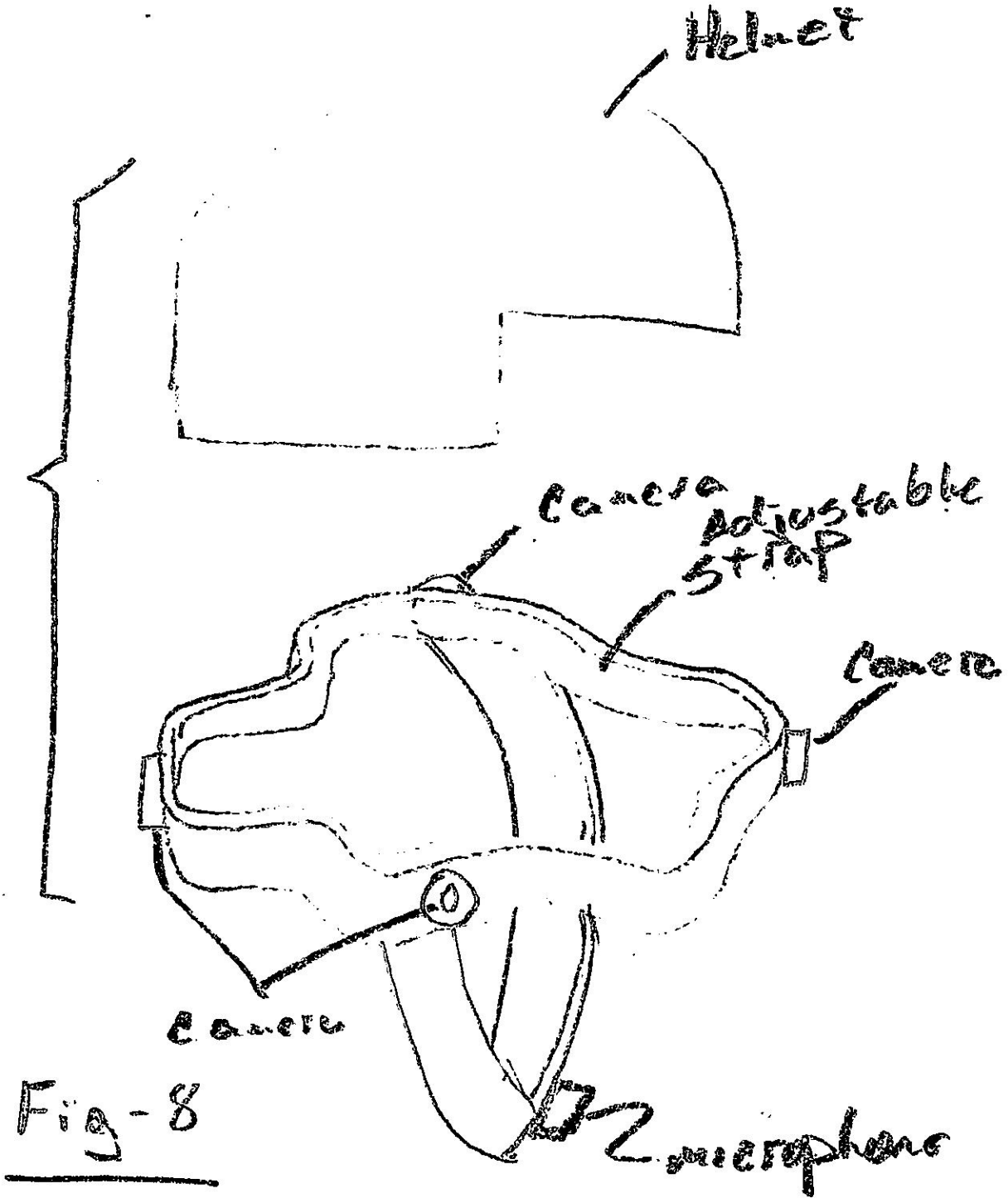
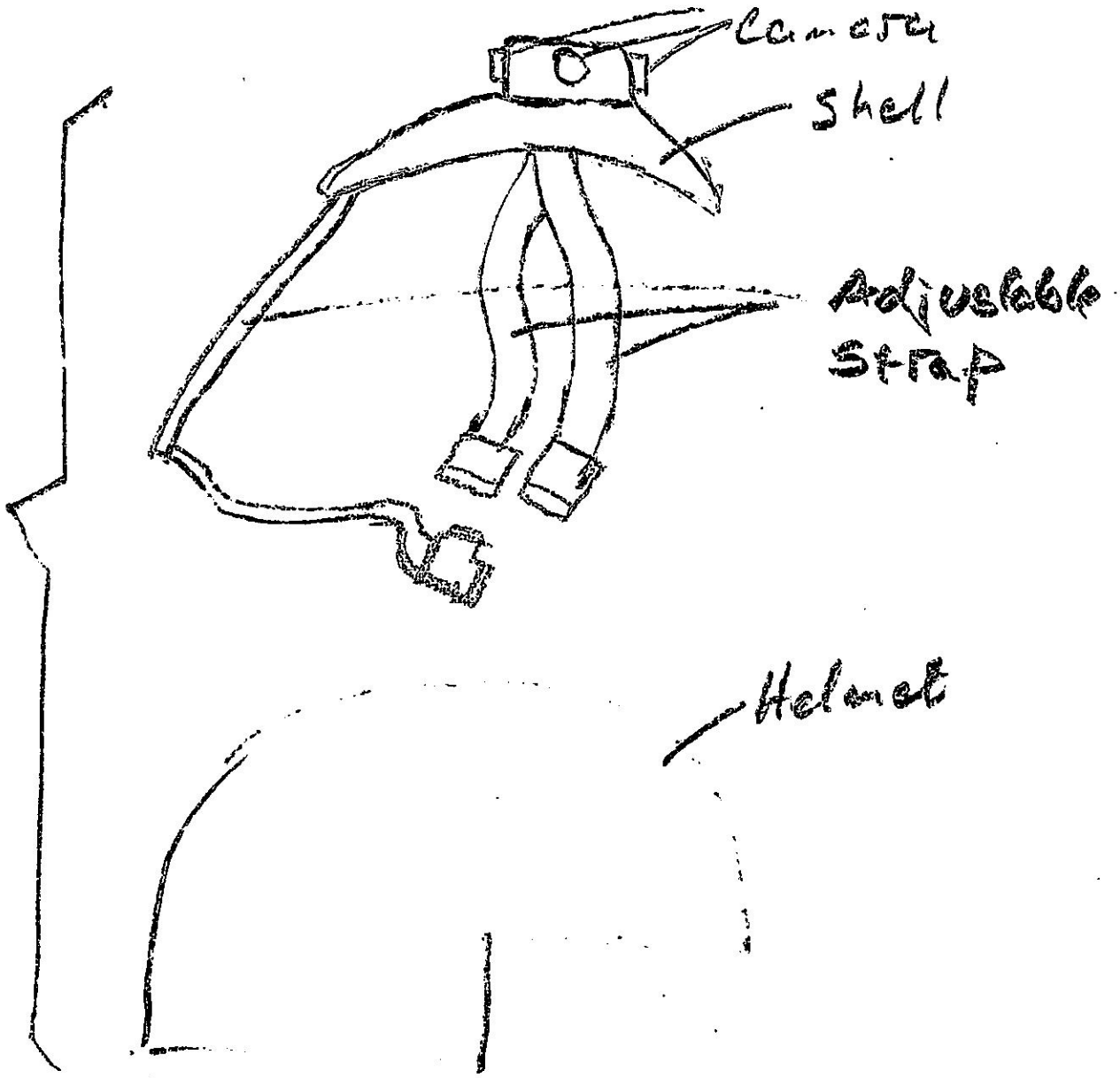


Fig-8

Fig-9



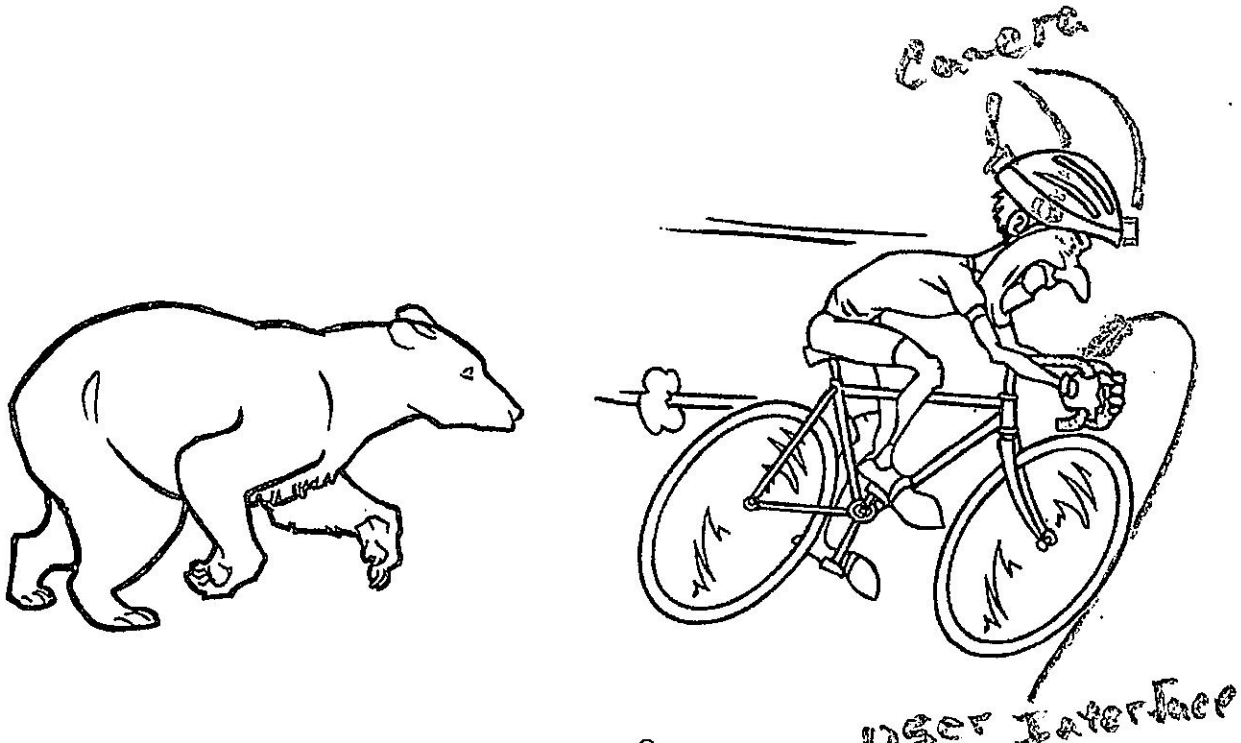


Fig. 10

Fig. 11

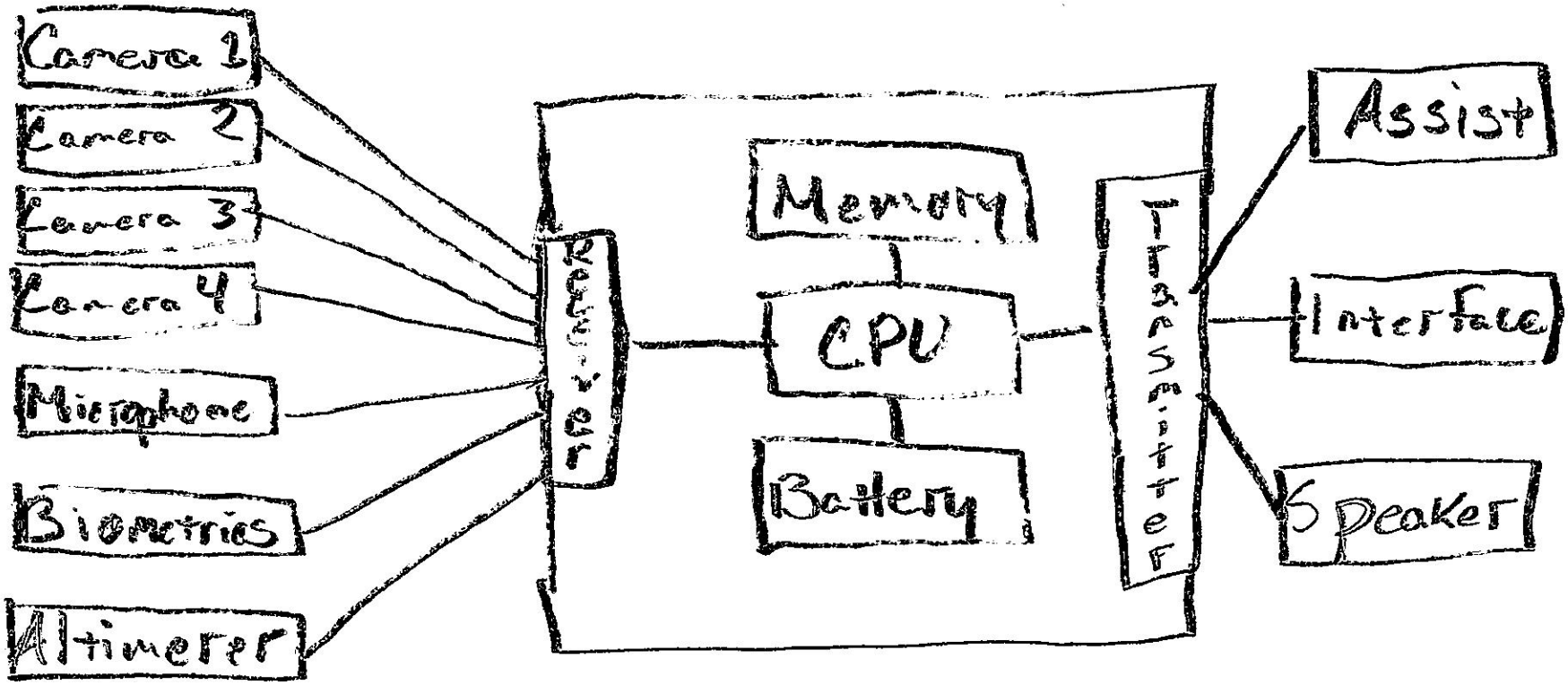

Camera 1
Camera 2
Camera 3
Camera 4
Microphone
Biometrics
Altimeter
Receiver
Memory
CPU
Battery
Transmitter
Assist
Interface
Speaker

Fig-12

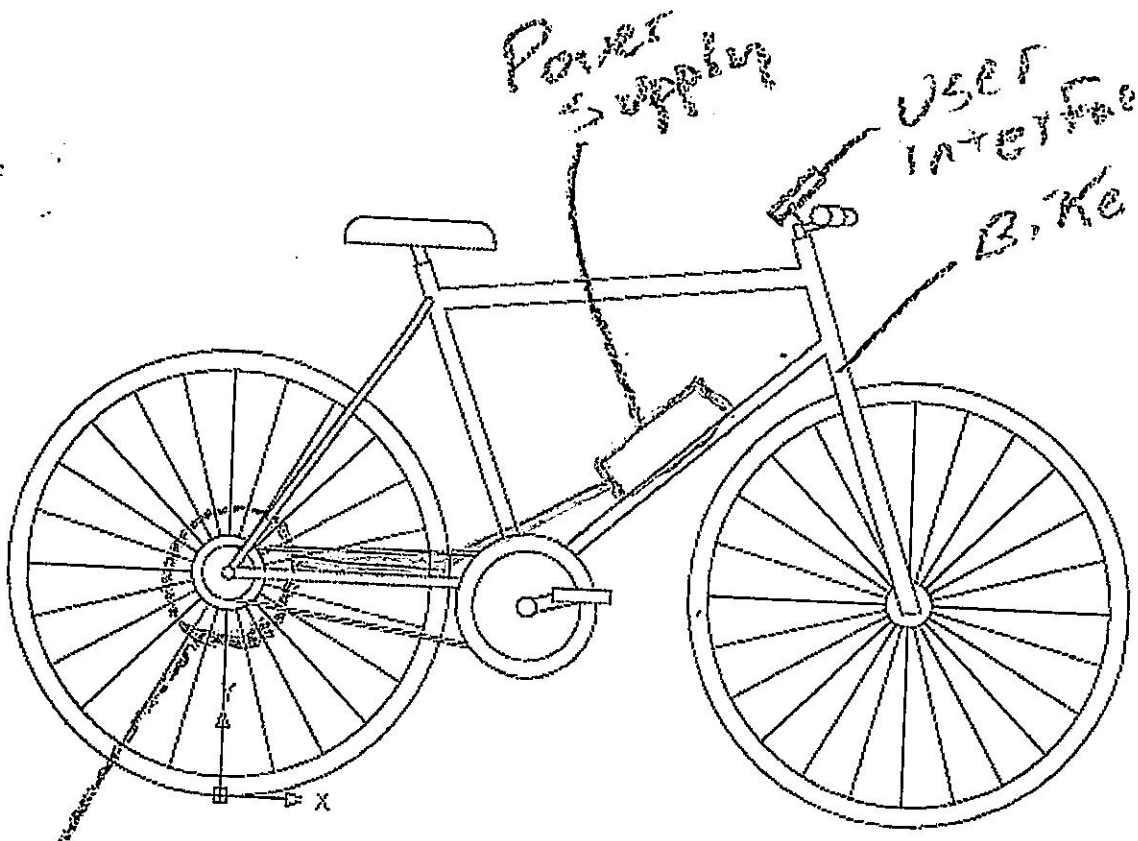


Fig. 13