

# **Ramdeobaba University, Nagpur**

## **IPR CELL**

### **PATENT REQUISITES DRAFT**

#### ***Instructions for writing Patent Draft:***

1. Please write as much as possible.
2. Draw Diagrams wherever necessary /possible.

**3. The First Applicant is always Ramdeobaba University ,Nagpur.**

From the second applicant onwards you can add as many inventors/applicants as required.

**The applicant must be faculty/UG/PG student/research scholar of RBU**

4. Write contact details of each applicant like email and mobile number

**5. Address of all inventors will be School name and RBU name/address. Do not write Personal address**

**6. The completed soft copy is to be emailed to [ipr@rkneec.edu](mailto:ipr@rkneec.edu)**

# **Ramdeobaba University, Nagpur**

## **IPR CELL**

### **PATENT REQUISITES DRAFT**

#### **1. Full Name and Address of the inventor(s) and applicant(s)**

<b>SN</b>	<b>Name of applicant/Inventor</b>	<b>Designation Faculty /UG/PG student/Research scholar</b>	<b>E mail ID</b>	<b>Mobile Number</b>	<b>Address</b>
1	Ramdeobaba University, Katol road, Nagpur.	RBU	ipr@rknec.edu	--	Ramdeobaba University, Katol road, Nagpur.
2	Mohammed Rushaad Qureshi	Student	qureshira1@rknec.edu	7499989267	Ramdeobaba University, Katol road, Nagpur.
3	Ojas Berdia	Student	berdiao@rknec.edu	9644744874	Ramdeobaba University, Katol road, Nagpur.
4	Ameya Bahadure	Student	bahadureap@rknec.edu	7387023066	Ramdeobaba University, Katol road, Nagpur.
5	Yash Soni	Student	soniyj@rknec.edu	9156637001	Ramdeobaba University, Katol road, Nagpur.
6	Atharva Rathi	Student	rathiaa_1@rknec.edu	9420386340	Ramdeobaba University, Katol road, Nagpur.

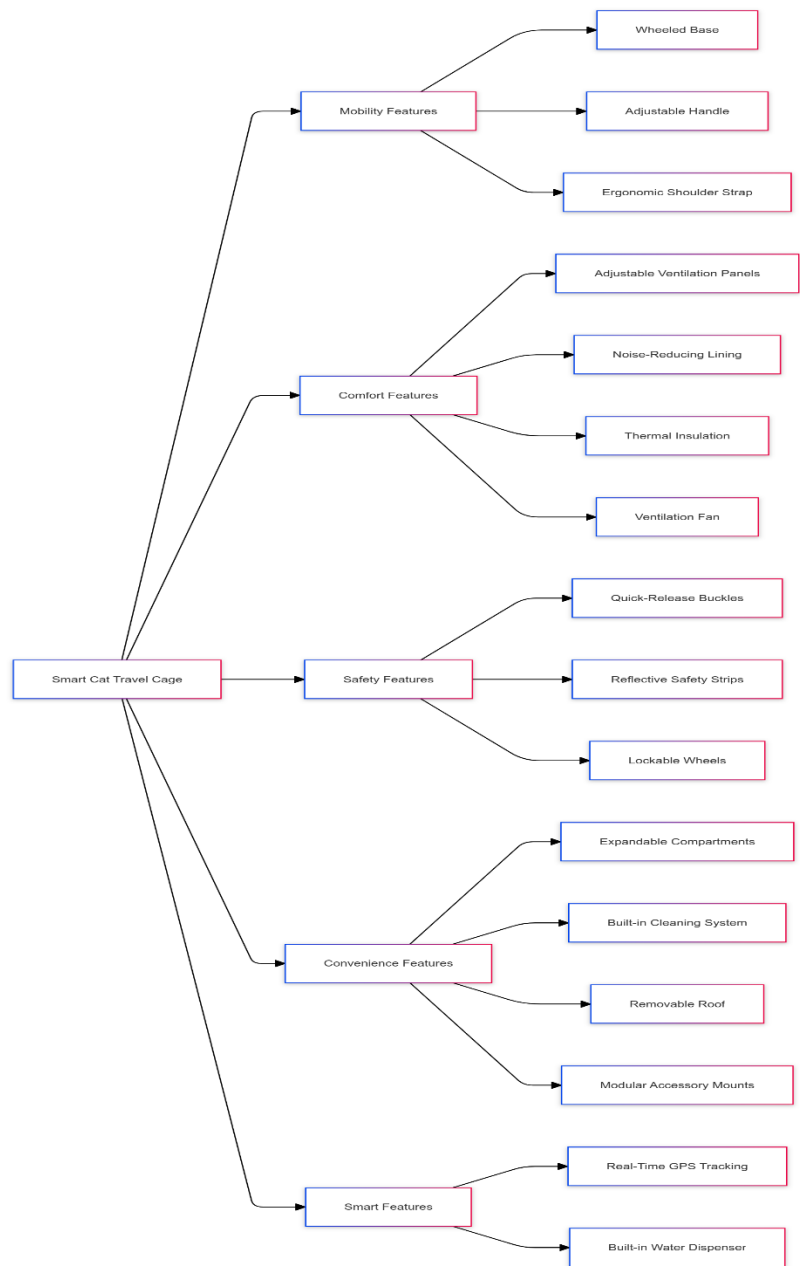
**2. What is the suggested title of the invention?**

Smart Cat Travel Cage with Integrated Wheels and Advanced Features

**3. The relevant prior art/existing technology and its disadvantages.**

The traditional cat travel cages are sometimes cumbersome and don't have the features that enhance manoeuvrability, comfort, and convenience. They never have wheels, meaning that they will be cumbersome to transport, may not have proper ventilation, temperature control, and other desirable factors that may provide a comfortable travel experience. This ultimately means that the cat as well as the owner gets stressed out. An innovative travel cage is greatly needed to eradicate these shortcomings by incorporating features of enhanced mobility, comfort, and safety.

**4. What are the objectives/advantages of your invention? Technical Problem or problems solved by your invention. Provide clock diagram.**



### Objectives/Advantages of the Smart Cat Travel Cage with Integrated Wheels:

- **Better Navigation and Portability:** -The wheeled base along with the customizable ergonomic handle enables easier rolling of the carrier over many surfaces. This enhances the reduction of physical tension in a pet owner compared to a regular carrier because it is manually or shoulder-carrying based.
- **Comfort to Cats:** - The possible additional feature like changeable ventilation panels, thermal insulation, noise-reducing lining, and retractable sunshade creates a more comfortable atmosphere within the carrier with the avoidance of considerable heat and noise and extreme illumination to the cat. The water dispenser is self-filling and has soft interior padding to make it comfortable for your cat on their travel.
- **Even More Security:** -With GPS tracking, the location will always be monitored in real-time; even when the item has been stolen or misplaced, this feature helps. Reflective safety strips along with reflective trim increase visibility in low light travel while making the travel cage more secure as it moves through dark areas.
- **Easy to Use:** - The foldable mesh panels, removable roof and built-in cleaning system with removable trays, make this cage easy to maintain and clean with some convenient feeling for the owner. Fast access using quick-release buckles is again a handy point for fast opening in case of emergency.
- **Customization and Storage:** -Expandable compartments and modular accessory mounts allow one to have spacious elements for keeping food and medication as well as allowing personalization with the attachment of any desired accessory like bowls and toys.
- **Less Stress to the Cats:** -The noise-filtering lining and interior lighting system decrease the sensory tension from cats while traveling, meanwhile, a ventilation fan and thermal insulation provide a comfortable space regardless of the external condition.
- **Versatility in terms of Durability and Stability:** -Anti-slip feet with lockable wheels will ensure stability in stationary objects and avoid any unwanted movement due to actions made during handling. A good quality material ensures better durability of travel cages during cases of harsh handling.

### **Technical Problems Solved by the Invention:**

- **Problem 1: Cumbersome Transportation**

Traditional carriers are difficult to transport due to the absence of wheels and adjustable handles, leading to user discomfort and inconvenience.

- **Solution:** The invention integrates a wheeled base with lockable wheels and an adjustable, retractable handle to enhance portability, allowing users to roll the carrier effortlessly.

- **Problem 2: Lack of Environmental Control for Pets**

Many carriers do not provide adequate control over ventilation, temperature, or noise, which can make the travel experience uncomfortable and stressful for cats.

- **Solution:** The cage is equipped with adjustable ventilation panels, a battery-operated fan, thermal insulation, a retractable sunshade, and noise-reducing lining to maintain a comfortable and stress-free environment.

- **Problem 3: Difficulty in Monitoring and Ensuring Safety**

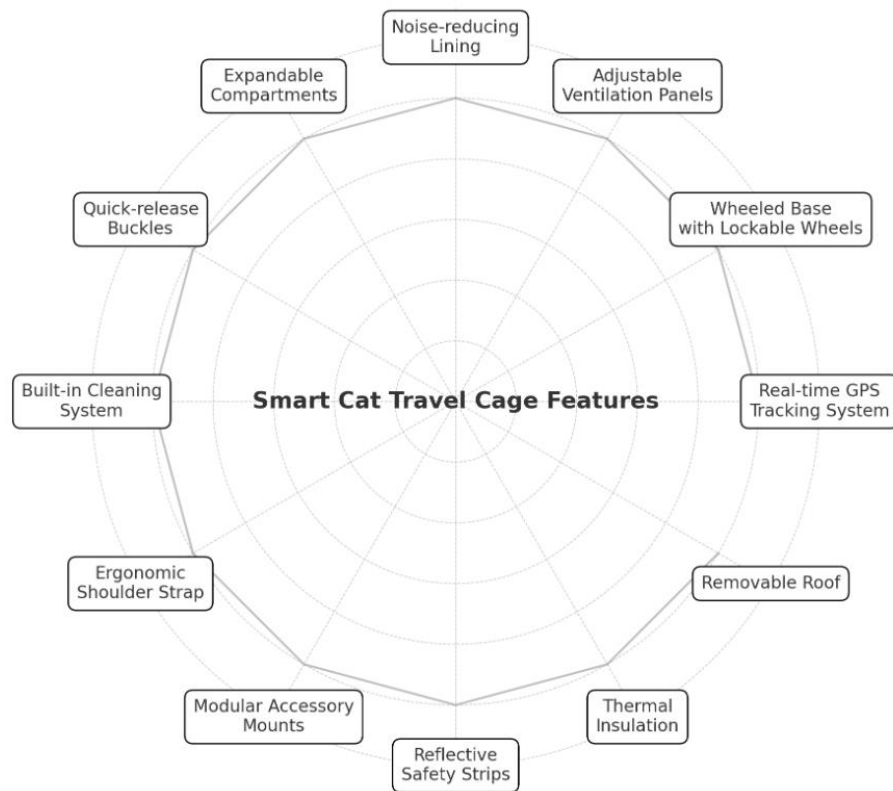
Traditional carriers offer no real-time tracking or safety features, making it difficult for owners to monitor their pets or locate the carrier if lost.

- **Solution:** The built-in GPS tracking system allows real-time location monitoring, while reflective safety strips and trim enhance visibility in low-light conditions.

- **Problem 4: Limited Accessibility and Customization**

Standard carriers often lack easy access and storage options for pet essentials, and cannot be customized for specific needs.

- **Solution:** The foldable mesh panels, quick-release buckles, detachable roof, and modular accessory mounts provide customizable access and storage, making the carrier more versatile.



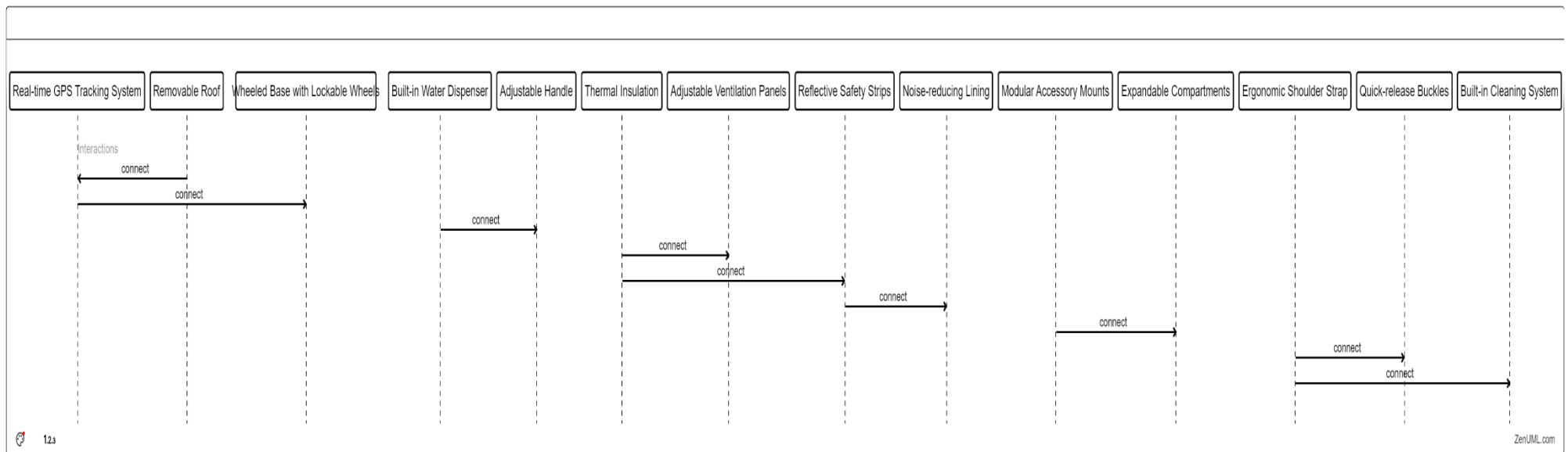
The clock diagram represents the key features of the Smart Cat Travel Cage, each corresponding to a specific hour:

- **12 O'clock:** Real-time GPS tracking system for monitoring the location of the cat.
- **1 O'clock:** Wheeled base with lockable wheels for easy movement and stability.
- **2 O'clock:** Adjustable ventilation panels for customizable airflow.
- **3 O'clock:** Noise-reducing lining to minimize stress from external sounds.
- **4 O'clock:** Expandable compartments for storing essential items like food and water.
- **5 O'clock:** Quick-release buckles for easy access and secure closure.
- **6 O'clock:** Built-in cleaning system with removable trays for hygiene.
- **7 O'clock:** Ergonomic shoulder strap for convenient carrying.
- **8 O'clock:** Modular accessory mounts for attaching bowls or toys.
- **9 O'clock:** Reflective safety strips for visibility in low-light conditions.



- **10 O'clock:** Thermal insulation to maintain a comfortable temperature inside.
- **11 O'clock:** Removable roof for easy access to the cat.

**5. Complete description of the invention supported with line diagrams. The description should include all the elements of the invention there construction with respect to other elements and function thereof. (*List all parts of your invention or steps in the process if you have a process and how the parts or steps relate to each other*).**



**Wheeled Base**

- **Construction:** The base of the travel cage is equipped with four durable, lockable wheels made from high-strength materials like rubber-coated polyurethane, designed to provide stability on a variety of surfaces. Each wheel can be individually locked to prevent the cage from moving while stationary.
- **Function:** The wheeled base allows for easy transport of the cage, reducing the need for the owner to carry it manually. Locking mechanisms provide safety by stabilizing the cage when it's not being moved.

## 2. Adjustable Handle

- **Construction:** An ergonomic, telescopic handle made of lightweight aluminum or high-strength plastic. The handle can be adjusted to different heights to accommodate various users and retracted for storage.
- **Function:** The handle provides ease of movement when pulling or pushing the cage. When not in use, it retracts into the cage structure for compact storage.

## 3. Adjustable Ventilation Panels

- **Construction:** The cage includes multiple mesh panels made of durable, breathable materials. These panels are attached to the sides and can be expanded or adjusted to control the airflow inside the cage.

- **Function:** The panels allow the user to regulate ventilation, ensuring that the cat remains comfortable in various environmental conditions. They can be opened for more airflow or closed in colder environments.

#### 4. Noise-Reducing Lining

- **Construction:** The inner walls of the cage are lined with sound-dampening materials such as foam or silicone. This lining is integrated into the frame without obstructing ventilation.
- **Function:** The lining reduces external noise, creating a calmer environment inside the cage, minimizing the stress on the cat during travel.

#### 5. Expandable Compartments

- **Construction:** The cage features integrated storage compartments, built into the outer frame. These compartments are expandable and designed to store essentials such as food, water, medications, and toys.
- **Function:** These compartments provide convenience for the owner by allowing easy access to essential items during travel. They are collapsible to save space when not in use.

## 6. Quick-Release Buckles

- **Construction:** Quick-release buckles made from reinforced plastic or metal are positioned on the cage doors and other access points. These buckles are designed for easy locking and unlocking with minimal effort.
- **Function:** The quick-release mechanism allows for fast access to the cat in case of emergencies. It also ensures that the cage remains securely closed during transport.

## 7. Built-in Cleaning System

- **Construction:** The bottom of the cage features a removable tray made from non-toxic, easy-to-clean materials such as plastic or silicone. The surfaces inside the cage are designed to resist dirt and odors.
- **Function:** This system allows for easy cleaning after each use, maintaining hygiene and minimizing odors. The tray can be removed, cleaned, and reinserted without disturbing the cat.

## 8. Ergonomic Shoulder Strap

- **Construction:** A padded, adjustable shoulder strap made from durable, breathable materials like nylon. It is detachable and can be stored in one of the compartments when not in use.

- **Function:** The shoulder strap allows the owner to carry the cage manually if needed, providing versatility in transport options.

## **9. Modular Accessory Mounts**

- **Construction:** The cage features multiple slots and mounts, compatible with various accessories such as food bowls, water dispensers, and toy holders. These mounts are placed on the interior walls.
- **Function:** These mounts allow the owner to customize the interior of the cage, enhancing the comfort and convenience for the cat during longer trips.

## **10. Reflective Safety Strips**

- **Construction:** Reflective strips are placed around the outer frame of the cage, made from high-visibility materials that reflect light in dark environments.
- **Function:** The strips enhance visibility in low-light or nighttime conditions, ensuring the safety of the cat and owner, especially in outdoor settings.

## 11. Thermal Insulation

- **Construction:** The walls of the cage are insulated with thermal materials like foam or gel-based insulation. An optional thermal cover can be added to provide additional protection in extreme weather.
- **Function:** The insulation helps regulate the internal temperature of the cage, keeping the cat comfortable in both hot and cold conditions.

## 12. Removable Roof

- **Construction:** The top of the cage includes a removable or openable roof panel, attached with quick-release latches or zippers. The roof is made from the same durable, breathable materials as the cage walls.
- **Function:** The removable roof allows for easy access to the cat without fully opening the cage door. It also facilitates cleaning and allows the owner to interact with the cat during travel.

## 13. Real-Time GPS Tracking System

- **Construction:** A built-in GPS tracker is integrated into the cage, powered by a rechargeable battery. The system connects to a smartphone app, allowing the owner to monitor the cage's location in real-time.

- **Function:** The GPS tracking system provides location data, ensuring the cat's safety, especially during long-distance travel or in case of theft or loss.

#### **14. Built-in Water Dispenser**

- **Construction:** An automatic water dispenser is integrated into the side of the cage, featuring a small water reservoir and a nozzle for the cat to drink from. The reservoir is refillable and detachable.
- **Function:** The water dispenser ensures that the cat stays hydrated during long trips, reducing the need for frequent stops.

#### **15. Ventilation Fan**

- **Construction:** A small, battery-operated fan is installed on one of the ventilation panels. The fan can be manually controlled or set to activate based on temperature and humidity sensors.
- **Function:** The fan ensures proper air circulation inside the cage, maintaining a comfortable environment for the cat, particularly in warm climates or during extended travel.

#### **Functional Relationships between Elements:**

- **Mobility and Handling:** The **wheeled base** and **adjustable handle** work together to ensure easy transportation, while the **ergonomic shoulder strap** provides an alternative method of carrying.
- **Comfort and Safety:** The combination of **adjustable ventilation panels**, **noise-reducing lining**, and **thermal insulation** ensures the cat's comfort and reduces stress during travel.
- **Convenience for Owners:** The **expandable compartments**, **quick-release buckles**, and **built-in cleaning system** are designed for easy use and maintenance, ensuring that the owner can efficiently manage the cat's needs.
- **Real-Time Monitoring and Hydration:** The **GPS tracking system** and **built-in water dispenser** ensure the cat's safety and well-being during travel, allowing the owner to monitor both the cat's location and hydration levels.





The line diagram above shows the key components of the Smart Cat Travel Cage, illustrating the relationships between various elements such as the wheeled base, adjustable handle, ventilation panels, noise-reducing lining, expandable compartments, quick-

release buckles, built-in cleaning system, ergonomic shoulder strap, modular accessory mounts, reflective safety strips, thermal insulation, removable roof, and GPS tracking system. Each component is connected to the central cage structure, representing how they function together to create a smart, efficient travel solution for cats.

## 6. How does your invention work?

The Smart Cat Travel Cage operates by integrating various advanced features designed for the comfort, safety, and convenience of both the cat and the owner. Here's how each component works:

- **Wheeled Base:** The cage is mounted on durable, lockable wheels that allow smooth movement across different surfaces. The wheels can be locked to keep the cage stationary when needed.
- **Adjustable Handle:** The ergonomic, retractable handle adjusts to different heights, making it easier for the user to transport the cage without straining their back.
- **Ventilation Panels:** These adjustable panels ensure sufficient airflow inside the cage. They can be customized depending on the external weather conditions to maintain a comfortable environment for the cat.
- **Noise-Reducing Lining:** The interior of the cage is lined with sound-dampening material to minimize external noise, helping to keep the cat calm during travel.

- **Expandable Compartments:** Storage compartments for food, water, medications, and other essentials are integrated into the design. These can expand based on the user's needs, offering practical storage solutions during trips.
- **Quick-Release Buckles:** The quick-release buckles allow fast access to the cage and ensure that the cat is securely contained when needed.
- **Built-in Cleaning System:** A set of removable trays makes cleaning the cage easy and convenient, ensuring that the cage remains hygienic even during long trips.
- **Ergonomic Shoulder Strap:** A padded, adjustable shoulder strap is available for situations where the cage needs to be carried by hand rather than wheeled.
- **Modular Accessory Mounts:** Slots or mounts are built into the cage for attaching accessories like food bowls or toys to make the cat more comfortable.
- **Reflective Safety Strips:** These strips enhance visibility during low-light conditions, ensuring safety when transporting the cat at night or in dim areas.
- **Thermal Insulation:** The cage is equipped with insulated walls or a thermal cover that helps regulate the internal temperature, ensuring the cat stays comfortable regardless of external conditions.

- **Removable Roof:** The roof can be detached or opened, allowing easy access to the cat for feeding or interaction during travel.
- **GPS Tracking System:** A built-in GPS tracker connects to a smartphone app, allowing the owner to monitor the real-time location of the cage, ensuring peace of mind during travel.

These components work together to provide a safe, comfortable, and convenient way to transport a cat, combining mobility with advanced features like environmental control, safety, and monitoring. The integration of smart technology (GPS, modular systems, adjustable ventilation, etc.) elevates the functionality of the traditional pet carrier. The Smart Cat Travel Cage operates as a highly functional and advanced carrier, designed to offer comfort, safety, and ease of transport for both cats and their owners. It features a wheeled base for smooth mobility and an adjustable handle for easy maneuvering. Inside, ventilation panels and noise-reducing lining ensure a calm, breathable environment, while thermal insulation maintains a stable internal temperature. The cage is equipped with quick-release buckles for easy access, expandable compartments for storage, and a built-in cleaning system with removable trays. The GPS tracking system allows real-time monitoring through a mobile app, while reflective safety strips and modular accessory mounts add to its practicality. Overall, the cage provides a comprehensive solution for secure, comfortable, and smart pet transportation.

## 7. What are the uses of your invention and state any different ways that your invention can achieve the desired result?

The Smart Cat Travel Cage has multiple uses, primarily aimed at improving the safety, comfort, and convenience of transporting cats during travel. Here are its key uses and the different ways it achieves these results:

### Uses:

1. **Safe Transportation:** The cage ensures the secure movement of cats during trips, whether by car, airplane, or on foot, with features like a wheeled base, adjustable handle, and quick-release buckles for easy access.
2. **Comfort for Cats:** The cage provides a calm and stress-free environment through noise-reducing lining, thermal insulation, and adjustable ventilation panels that maintain a comfortable temperature and reduce external noise.
3. **Hygiene Maintenance:** The built-in cleaning system, which includes removable trays, makes it easy to clean and maintain hygiene during extended trips.
4. **Convenient Storage and Access:** Expandable compartments allow pet owners to store essentials like food, water, or medications, while modular accessory mounts offer customization.
5. **Real-Time Monitoring:** The integrated GPS tracker allows real-time location tracking, which is especially useful for long-distance travel or in cases of theft or loss.
6. **Improved Visibility and Safety:** Reflective safety strips and trim enhance visibility in low-light conditions, ensuring the cat's safety during nighttime transport.
7. **Stress Reduction:** The noise-reducing materials, soft interior, and insulated panels create a low-stress environment for the cat, which is crucial during long trips.

### Different Ways to Achieve the Desired Results:

1. **Mobility Options:** The cage can be wheeled or carried using the ergonomic shoulder strap, offering flexibility based on travel conditions.
2. **Environmental Control:** The adjustable ventilation panels, along with the optional use of a sunshade or thermal insulation, allow for customization of the internal environment depending on the external conditions (heat, cold, drafts).
3. **Emergency Access:** The quick-release buckles and detachable roof provide immediate access to the cat in emergency situations.
4. **Tracking and Monitoring:** The GPS tracking system ensures the owner can track the cage in real-time via a mobile app, which adds an extra layer of security and peace of mind during travel.

These features collectively ensure that the cage meets the desired objectives of safe, comfortable, and monitored transportation. The flexibility in design allows for multiple approaches to achieve these goals depending on the situation or environment.

## **8. Alternatives for any components/materials/steps of the invention, e.g. bolt can be replaced by rivets or adhesives.**

There are quite several components and materials that, for the Smart Cat Travel Cage, may be replaced with other counterparts without compromising the functionality and performance. Some of the alternatives to the various parts include:

Wheeled Base:

Alternative: The standard lockable wheels of the base could be replaced by ball-bearing wheels or air-filled tires to ensure smoother movement over uneven surfaces or rough grounds.

Adjustable Handle:

Alternative: A telescopic handle, like that of a luggage, can be allowed to store with a fixed and padded handle to provide extra support.

Ventilation Panels:

Alternative: Perforated fabric can replace plastic or metal mesh panels to provide more flexibility. The manual controls for ventilation can be replaced by solar-powered fans.

Noise-Reducing Lining:

Alternative: Instead of sound-dampening material such as foam, acoustic fabric or vibration-dampening rubber panels can be used which dampen the noise more.

### Thermal Insulation:

Alternative: Reflective thermal foil could be applied in place of standard insulation materials for better temperature control.

Alternatively, phase-change materials can be applied which automatically absorb or emit heat.

### Inbuilt Water Dispenser:

Alternative: A detachable water bowl that self-refills could be used instead of a water bottle mounted on the inside of the cage with a spill-proof lid

### Compartments:

#### Expandable

Alternative: Modular pouches or removable storage bins for storing food, medication, and other items may replace expandable compartments

### Buckles:

Alternative: Velcro straps or magnetic clasps can be used for quicker access or snap locks for firmer closure in place of quick-release buckles.



#### Reflective Safety Strips:

Alternative: Instead of using reflective strips, there could be LED lights or phosphorescent (glow-in-the-dark) trim incorporated for increased safety in nighttime.

#### Material for Cage Structure:

Alternative: Instead of aluminum or high-strength plastic for the frame, carbon fiber or light weight steel could be incorporated to make it very durable yet light in weight.

#### Cleaning System:

Alternative: Instead of removable trays, the surface could be self-cleaning through antimicrobial coatings or disposable liners for easier maintenance.

#### GPS Tracker:

Alternative: Instead of an inbuilt GPS, an independent tracking collar for the cat may be deployed; this way, the cat will be tracked apart from the cage.

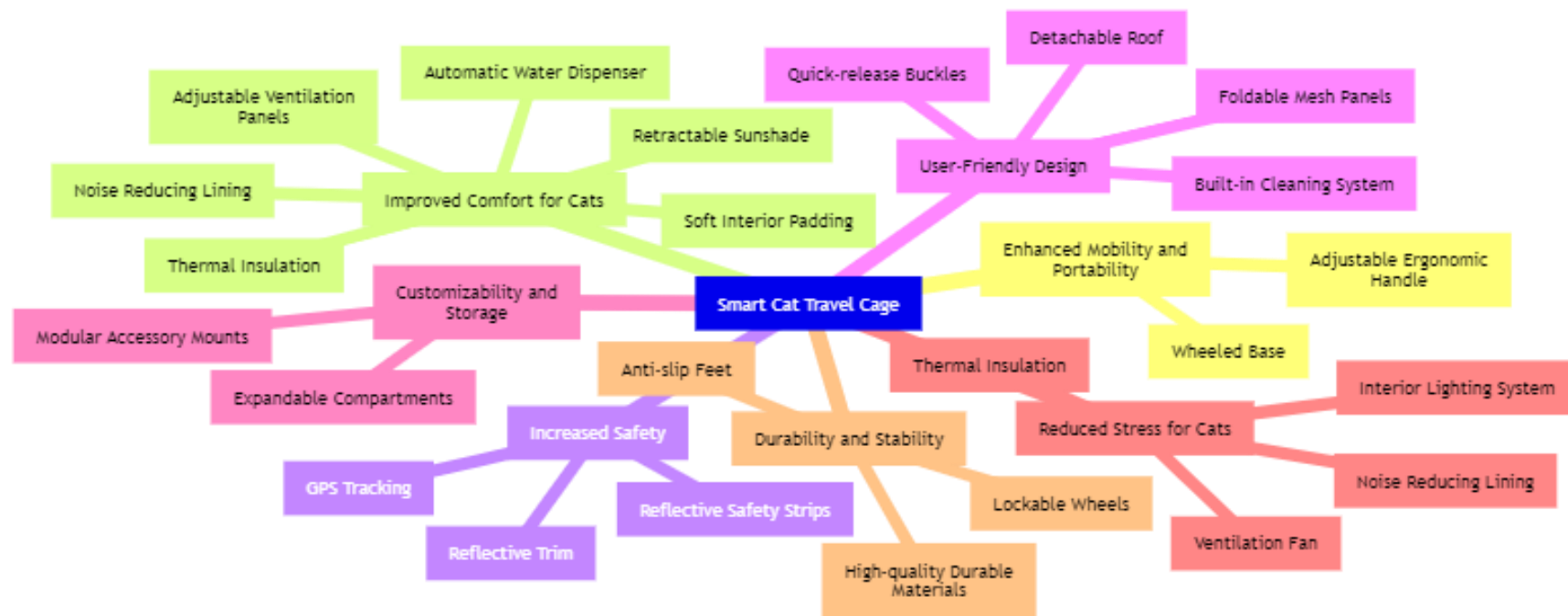
Ventilation Fan:

Alternative: For fans with a battery, solar-powered fans or passive air-cooling systems, which cool through natural airflow, could be utilized, reducing even more the need for frequent recharging.

Detachable Roof

Alternative: In cases where a detachable roof is utilized, zippered mesh windows, or rolling fabric covers may be adopted for easy accessibility.

## **9. Claims**



- **Real-Time GPS Tracking:** Allows owners to monitor their cat's location accurately at all times.
- **Health Monitoring Features:** Tracks vital signs and environmental conditions, ensuring the cat's well-being.
- **Safety Mechanisms:** Secure locking systems and escape-proof designs enhance safety during travel.
- **User-Friendly App:** Intuitive interface for easy access and control of features.
- **Comfort-Oriented Design:** Ensures a cozy environment for cats, reducing travel stress.
- **Durability:** Made from high-quality materials that withstand wear and tear.
- **Easy to Clean:** Designed for hassle-free maintenance and hygiene.
- **Positive User Reviews:** High ratings and low return rates reflect overall satisfaction.
- **Comparative Advantage:** Offers significant benefits over traditional carriers, such as enhanced safety and monitoring capabilities.