

Squirrel Trap

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Type: Design project
Time: Twelve weeks
Location: Take home work with discussion in class

Summary

In many cities it is illegal to kill squirrels, even if they are destroying your home by chewing holes in the eaves or other parts of the house. Thus, the only legal option to deal with the problem is to catch the squirrels, without harming them, and turn them loose in the yards of the mayor or other city official. This exercise involves the design of a means to apprehend the squirrels, a system for transporting the squirrels to a recommended release location, and a means for releasing the squirrels without harming the squirrels or the home owner/operator.

The objective of this project is to design a trap or other method to catch common squirrels and a means to transport the squirrels to an approved release location. The students will be asked to develop a creative design, to conduct a patent search, and prepare an official patent application for their squirrel trap.

ABET Descriptors

Engrg. Sci. Content: First Year Engineering
Type: System
Elements: Develop criteria and specifications, planning, synthesis, analysis
Features: Formulation of problem statement and specifications, creativity, feasibility, alternative solutions, open-ended, concurrent design, detailed system description, development of patent application
Constraints: Economics, ease of use, safety
Effort: Team

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Problem Statement:

In many cities it is illegal to kill squirrels, even if they are destroying your home by chewing holes in the eaves or other parts of the house. Thus, the only legal option to deal with this problem is to catch the squirrels, without harming them, and then turn them loose in the yards of the mayor or other city officials. This exercise requires the design of a means of apprehending the squirrels, a system for transporting the squirrels to a recommended release location, and a means for releasing the squirrels without harming either the squirrels or the home owner/operator.

You are to develop a method to apprehend common squirrels and a means to transport the squirrels to an approved release location. Your design must satisfy all local, state, and federal requirements with respect to squirrel safety, human safety, health issues, etc. You are also to conduct a patent search and prepare an official patent application for your squirrel trap.

The following constraints apply:

- The device must effectively catch squirrels without endangering the health and well being of the squirrels.
- The device and all associated components must be easily operated by a home owner.
- The device and any associated components and systems must provide a means to transport the captured squirrels to an acceptable location and safely release the relocated squirrels.
- The device and all associated components must meet all local, state, and federal requirements related to safety (squirrel and handler) and animal handling.
- The device and any associated components must not infringe on any current patents.

The following reports are required:

- A preliminary design report showing all original alternative design concepts. This report should include the results of a patent search (at least back through 1975) on squirrel and small animal apprehension devices and transport devices. In addition this report should include a summary of any local, state, or federal requirements or standards related to the catching and transporting of squirrels (or small animals). All requirements that affect the current product must be pointed out explicitly.
- A final design report that includes drawings, a bill of materials, and a description of major design features of the device developed indicating that none of the identified patents have been infringed upon and that all identified standards and requirements have been met.
- A patent application for the proposed trap.

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Engineering Notes:

The choice of a squirrel relocation system as the focus for this project is somewhat arbitrary; any product or device could be easily inserted in place of the squirrel system. The main thrusts of the project are

- To force students to determine what government (or voluntary), if any, requirements and standards apply to the product that they are designing.
- To force students to check history, in this case do a patent search. Patent searches can be done at not cost at several locations on the web (at least back to 1975). Many university libraries will have copies of patents (maybe on microfiche) or they have a set of patent summaries that include an abstract and some figures. Finally, copies of patents can be obtained, probably at some cost.
- To have students compare their designs to any patents and to any requirements identified. The choice of the product or device to be designed will obviously affect the number of patents and requirements identified.
- To have students develop an actual patent application. Information on patent application requirements can be found on the web page for the US Patent and Trademark Office (USPO). Patent applications should include drawings to Patent Office standards and a complete write up (use patents identified in the patent search as guide).

Objectives and Comments:

The project is designed to have the students conduct extensive research into previous designs and current safety (and other) requirements related to the product that they are considering. The project will also familiarize students with the process of obtaining a patent.

Expected Outcome:

A preliminary report that documents the various concepts considered for the design, applicable standards/requirements, and the patent research.

A final report that describes the final design and documents that the proposed design meets all requirements/standards and does not violate any current patents.

A complete patent application, ready for submission to the patent office.

Discussion and follow-on activities:

If possible, have a patent attorney meet with the class to discuss the reasons for patenting a product and the typical steps in obtaining a patent.

A field trip to city hall and/or the library to investigate relevant standards and requirements could be quite helpful to the students.