

**CHAPTER 7**  
**MANHATTAN COLLEGE**

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# AUTOMATED DIE ROLLING DEVICE

*Designers: Maribel Cruz, Stephan Rutgerson, Suzanne Wright*

*Client Coordinators: Laura Meza, Dan Schipf*

*Brandywine Nursing Home, Briarcliff Manor, NY*

*Supervising Professor: Dr. Zella Kahn-Jetter*

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## INTRODUCTION

A device was designed so that residents of a nursing home could reliably roll dice with the push of a button or activation by breath control.

## SUMMARY OF IMPACT

The Automatic Die Roller is now in the recreation room of the nursing home where the residents and caregivers find it rewarding to use.

## TECHNICAL DESCRIPTION

The Automatic Die Roller is contained in a square polystyrene box with a sloping roof. The lid is hinged to allow access to the interior.

Figure 7.2 shows the two dice resting on the platform that flips the dice upward. The platform is activated by a push-type solenoid. A side cut-away view of the device is shown in Figure 7.3.

The cost of the Automatic Die Roller is \$147.73.



Figure 7.1. Automated Die Rolling Device.

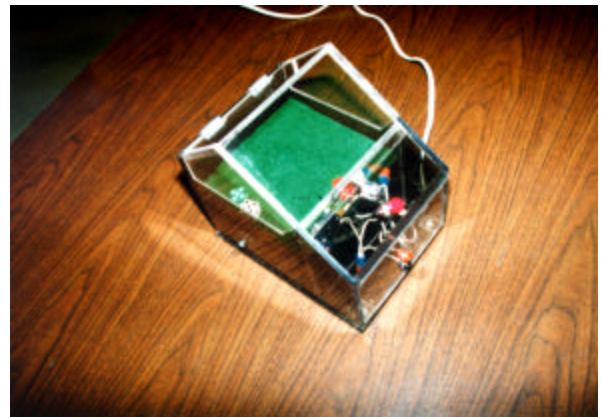


Figure 7.2. Close-up Showing the Two Dice Resting on the Platform.

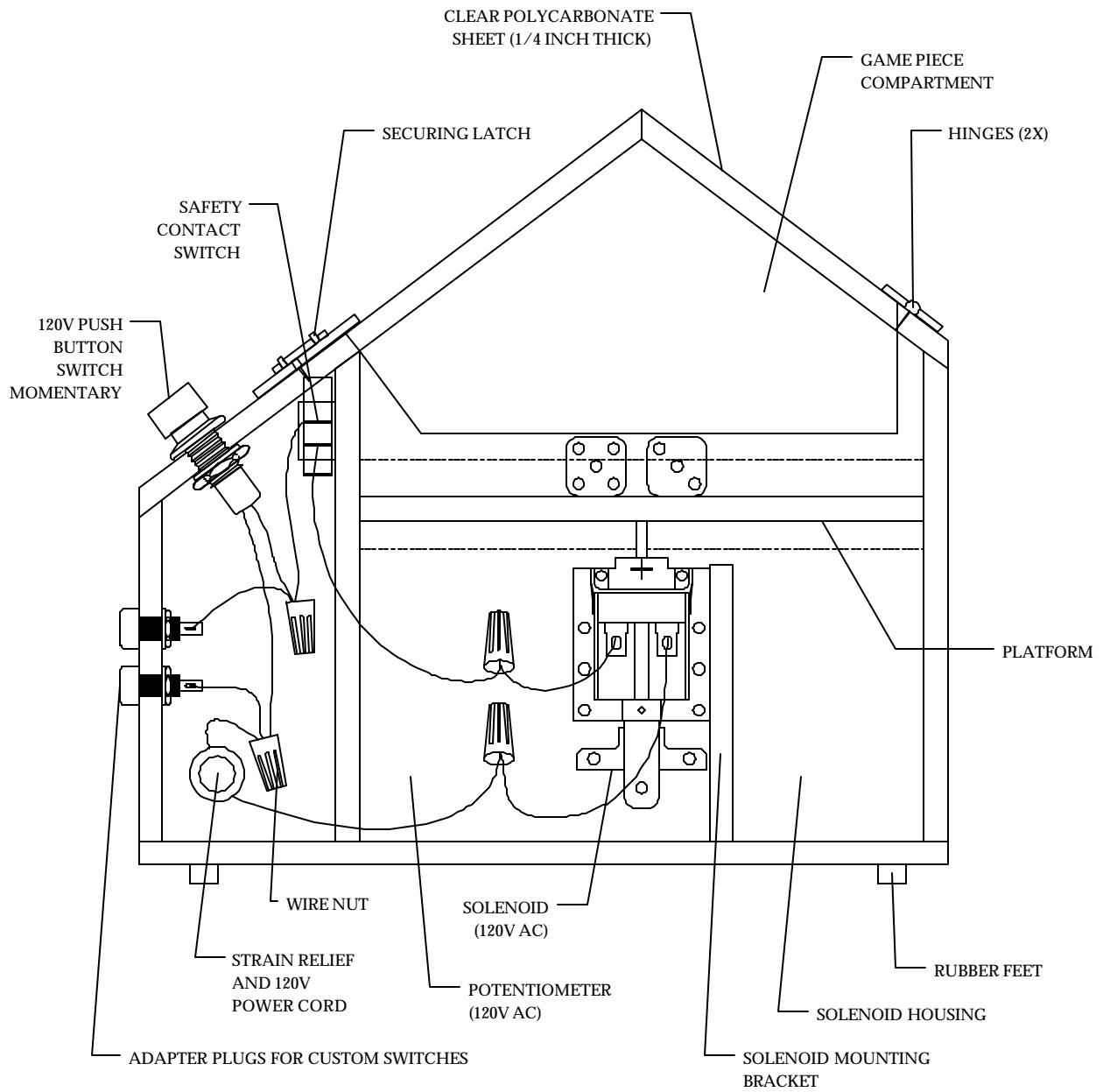


Figure 7.3. Side Cut-Away View of the Automated Die-Rolling Device.

# VENTILATING SYSTEM FOR A NURSING HOME GREENHOUSE

*Designers: Michael Donaghue, Jennifer Grzan, Stephen Grzic  
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## INTRODUCTION

During their initial visit to a nursing facility, the designers were shown the greenhouse where many products built by previous Manhattan College students are in use. They noticed that the ventilation system in the greenhouse was noisy and the room was very warm. A project to improve the situation was defined.

## SUMMARY OF IMPACT

The existing exhaust system was evaluated. It was determined that adding new components and retrofitting others would result in a quieter, more efficient exhaust fan. The greenhouse is now much more pleasant with the new equipment in place.

## TECHNICAL DESCRIPTION

The new exhaust system consists of a motorized damper intake and a fan with an exhaust louver. Figure 7.4 shows the position of these elements in a plan view of the walls of the 15 X 21 ft rectangular greenhouse room.

A Dayton 4-wing aluminum blade Venturi fan was selected for the fan element. The fan is powered by a 1/4 HP electric motor. It has a 10-inch propeller diameter and is encased in a 12-inch frame. At 1140 rpm the fan draws air at a rate of 945 cubic feet per

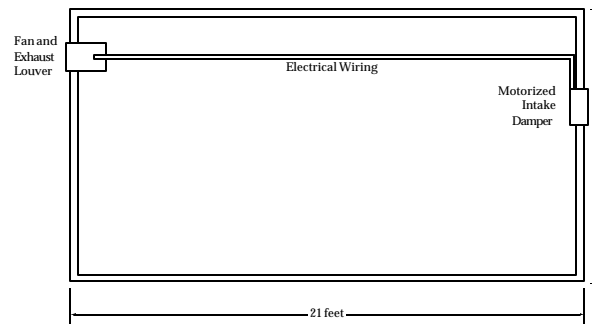


Figure 7.4. A Ventilating System for the Nursing Home Greenhouse.

minute. This installed fan is shown from the interior of the room in Figure 7.5.

To create negative pressure, a 23 X 23-inch motorized damper was selected. The damper is wired so that it opens automatically whenever the fan on the other side of the room is turned on. The damper incorporates a bug screen. Figure 7.6 shows the damper in the closed position behind the three designers.

The cost of the Greenhouse Exhaust System is \$359.25.



Figure 7.5. Installed Fan Shown From Interior.



Figure 7.6 Designers and Device with Damper in Closed Position.

# MODIFICATIONS AND ENHANCEMENTS TO A CONSOLE TV STAND

*Designers: Alper Basoglu, Leon Fendley, Christopher Sheridan*

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## INTRODUCTION

A nursing home's large-screen television required a more stable and versatile base.

## SUMMARY OF IMPACT

The residents and staff now have a television system that can be safely raised and moved about the floor more easily. This has eased burdens on the staff.

## TECHNICAL DESCRIPTION

Figure 7.7 shows two of the three designers with their product. The base is a trapezoidal box made of wood and covered with carpeting. Wheels on the base make horizontal movement easy. Two sets of safety straps

prevent the television set from tipping.

The cost of the materials for this project was less than \$250.



Figure 7.7. Portable TV Stand.

# ENHANCED ELECTRONIC TV CONTROL SYSTEM

*Designers: Eric Glatzl, Stephen Lebron, Gregory Pascal*

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## INTRODUCTION

A patient with quadriplegia has had difficulty operating a conventional remote control device for the television set in his room. He requested a device mounted to his bed rail that would enable him to operate the TV more easily.

## SUMMARY OF IMPACT

The designers developed a working device with which the patient is pleased.

## TECHNICAL DESCRIPTION

The designers determined that a box with eight large buttons could serve the needs of this patient, provided that the device performed the following functions: Power on/off, Channel up/down, Volume up/down, Television toggle switch, Cable box toggle switch, and Channel recall. Figures 7.8 and 7.9 show the control box with the buttons.

The cost of the Easy Touch Remote Control is \$492.93.



Fig. 7.8. Top View of the Easy Touch Remote Control.

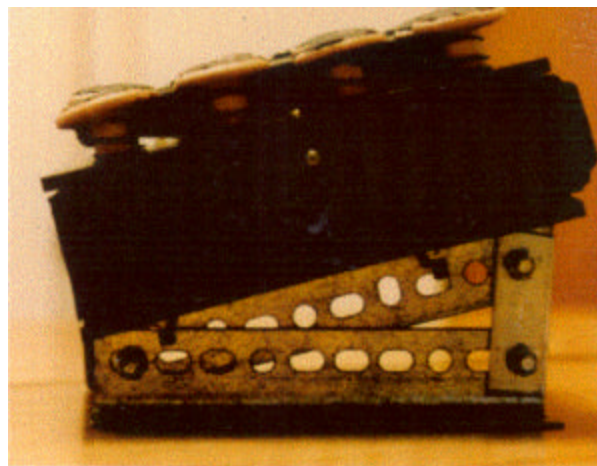


Fig. 7.9. Side View of the Easy Touch Remote Control.

# A TABLE-SIZE ROULETTE WHEEL

*Designers: Anthony Ferrara, Timothy Kim, Man Phan*

*Client Coordinator: Dan Schipf*

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## INTRODUCTION

During a visit to a nursing home, the designers observed that residents needed more varied recreation. Designers from Manhattan College had previously constructed a wheel of fortune for the residents. After consulting with the client coordinator, these designers decided that a roulette wheel would be well received.

## SUMMARY OF IMPACT

Although it was initially too large for the entrance, the roulette wheel was subsequently modified. The residents are pleased with the device.

## TECHNICAL DESCRIPTION

The design includes two tables, one for the numbers, and the other for the roulette wheel. The heights were set so that residents in wheelchairs could fit beneath them. Figure 7.9 shows the first table.

Figure 7.10 shows the table in which the wheel is mounted. The walls were set high to prevent the ball from leaving the table when in operation. A motor, connected by a belt and pulleys to the spindle beneath the table, spins the wheel. Rotation of the wheel is initiated by a standard switch, button switch or breath control switch. The table is covered with Plexiglas to prevent the ball from escaping. A contact switch prevents the motor from operating unless the cover is in place.

Figure 7.11 shows the motor assembly.

The cost of the Roulette Wheel is \$354.66.



Figure 7.9. Roulette Wheel.

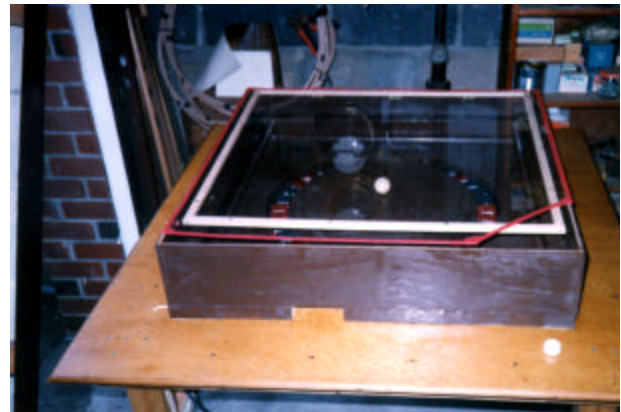


Figure 7.10. Table in which Wheel is Mounted.



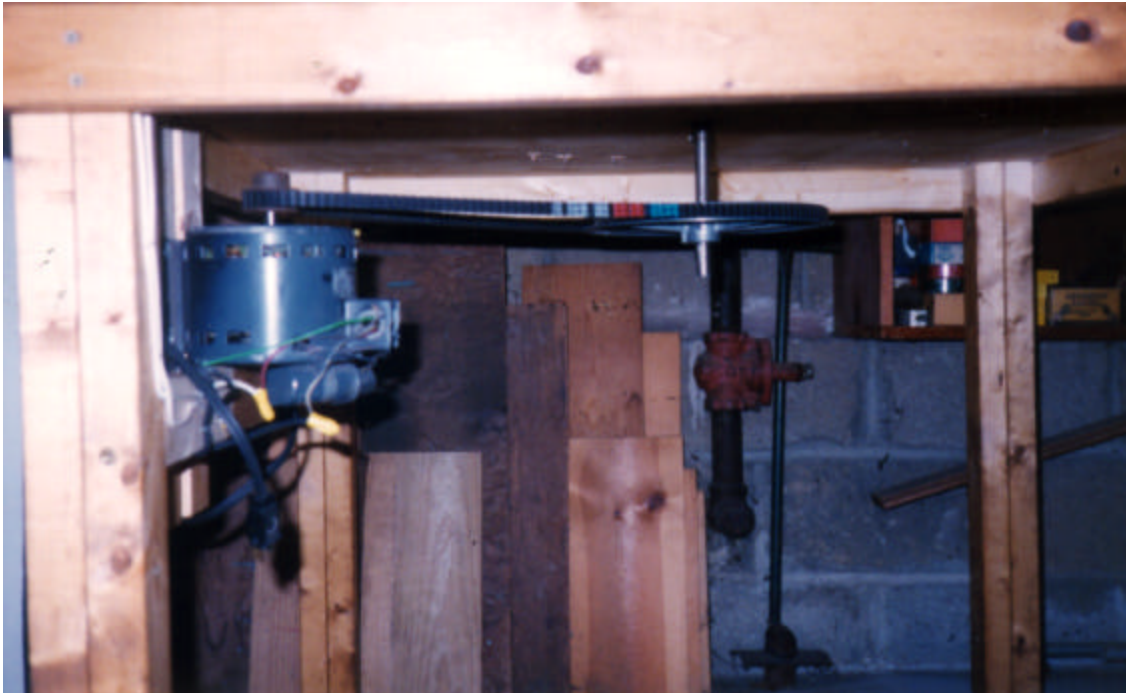


Figure 7.11. Motor Assembly.

# A PNEUMATIC TV CONTROL SYSTEM

*Designers: Michael Christopher, Scott Sharp, Alexander Miranda*

*Client Coordinators: Laura Meza, Dan Schipf*

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## INTRODUCTION

The designers modified a TV remote control device for use by people with physical disabilities. They chose to apply pneumatic technology to develop a device that could be easily controlled by breath activation.

## SUMMARY OF IMPACT

The pneumatic TV remote control device operates well and reliably.

## TECHNICAL DESCRIPTION

Figure 1 shows the pneumatic remote control. It consists of three tubes mounted on an adjustable arm and connected to pressure switches. It was determined by experiment that a pressure switch setting of 3" of water is adequate for both sip and puff operations. Each of the three tubes and switches control one of the following functions: Power on/off, Channel up/down, or Volume up/down.

A schematic diagram of the Pneumatic Remote Control is shown in Figure 7.13.



Figure 7.12. Pneumatic Remote Control.

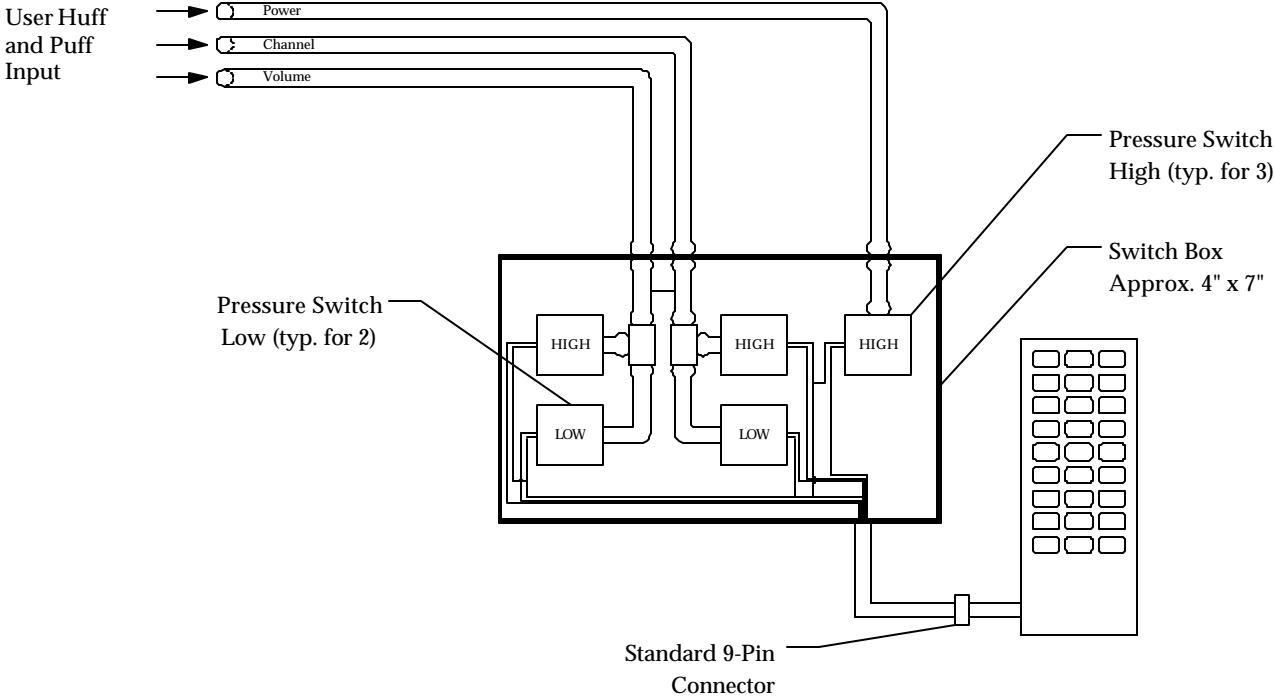


Figure 7.13. Schematic Diagram of the Pneumatic Remote Control.

