



Chapter 2

Physical Parts

Outline

- 1 Movement
- 2 Transmission systems
- 3 Actuators
- 4 Sensors
- 5 Measuring devices



- Movement

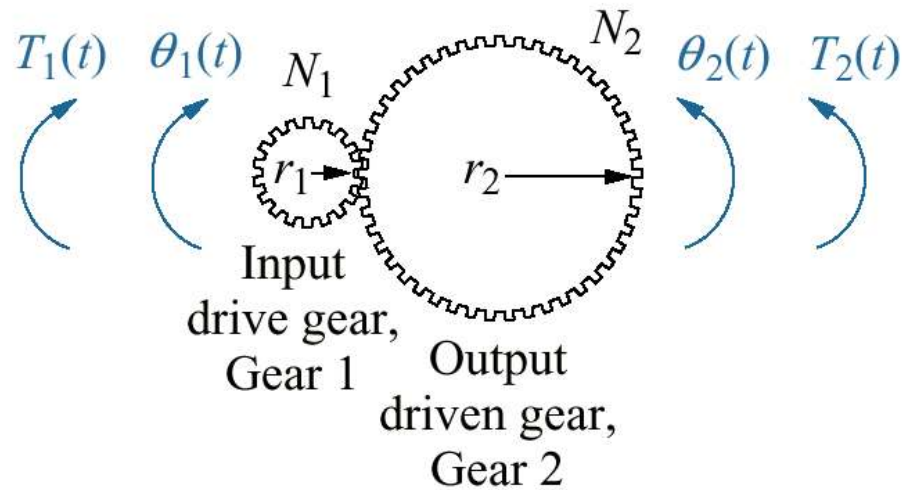
- ♦ Vertical
- ♦ Horizontal
- ♦ Rotational



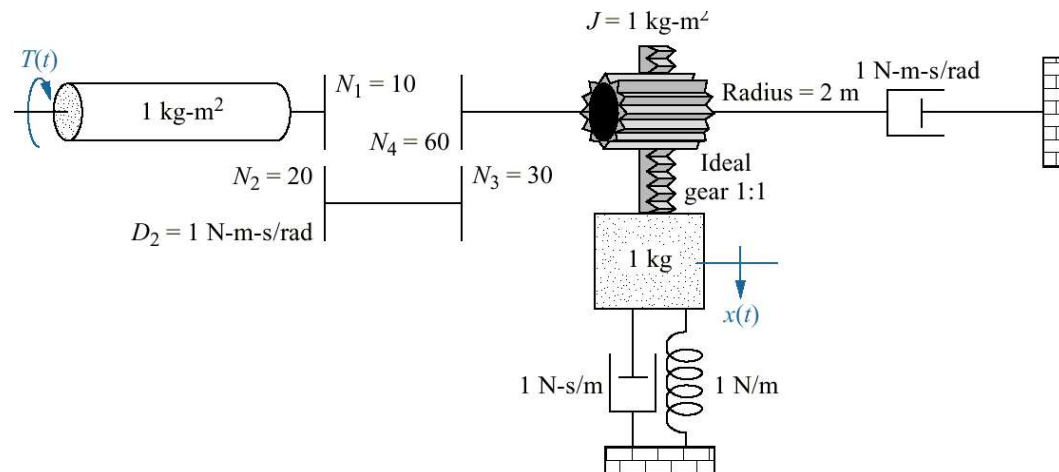
Transmission System

- Straight (Vertical and Horizontal)
- Angle
 - ◆ Gear
 - ◆ Belt
 - ◆ Shaft
 - ◆ Chain
 - ◆ Etc





Gear



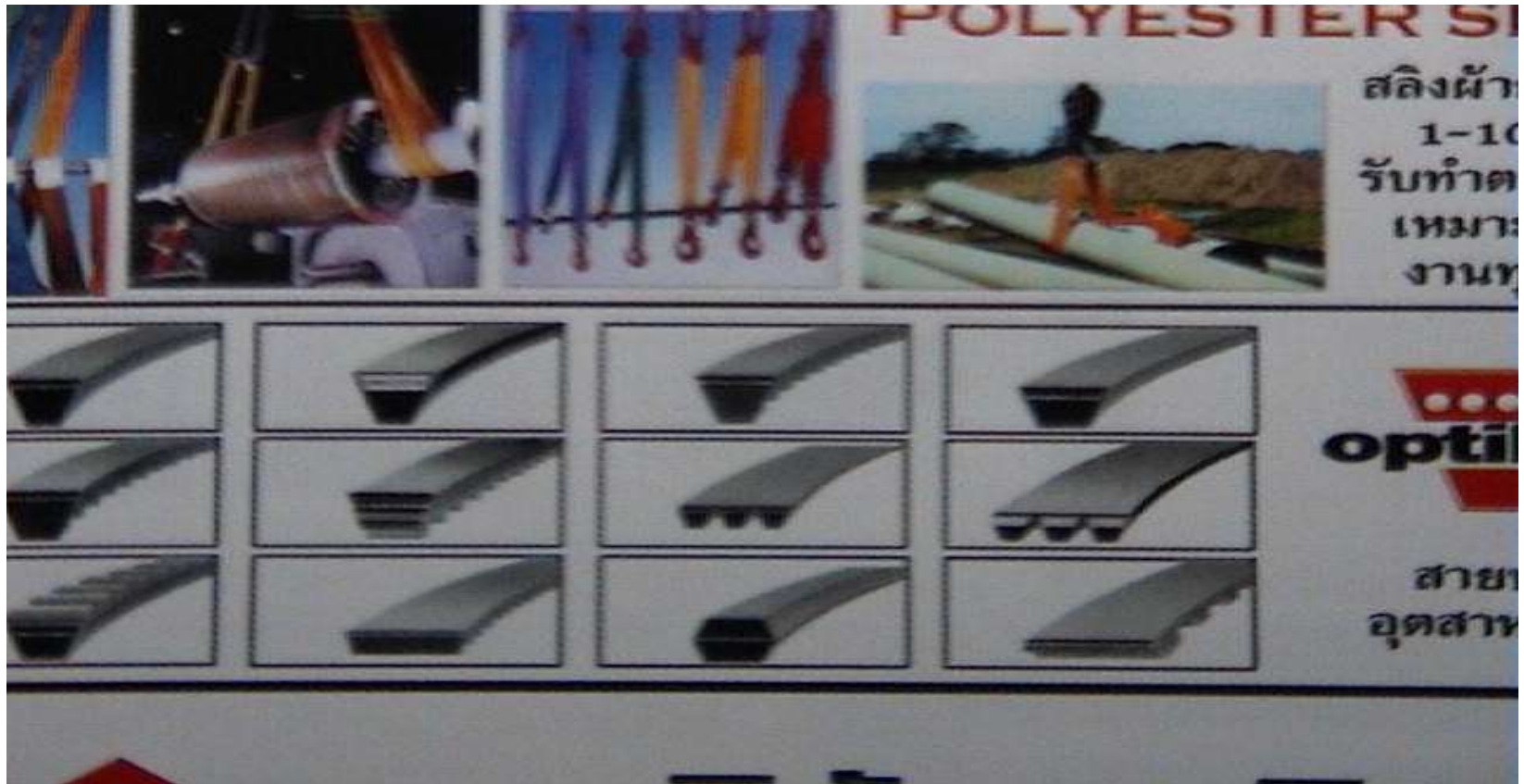


Gear

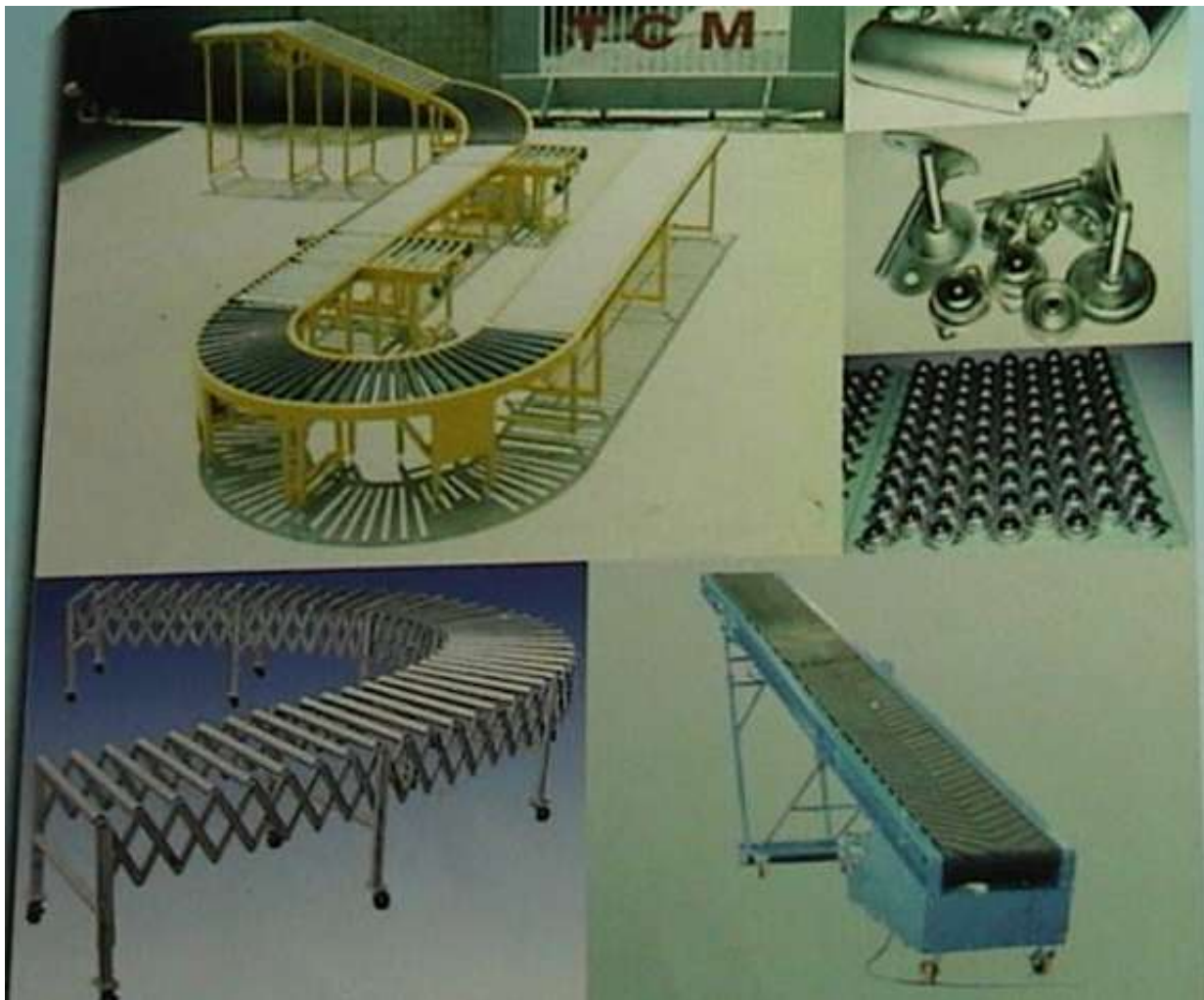


Belt

Belts

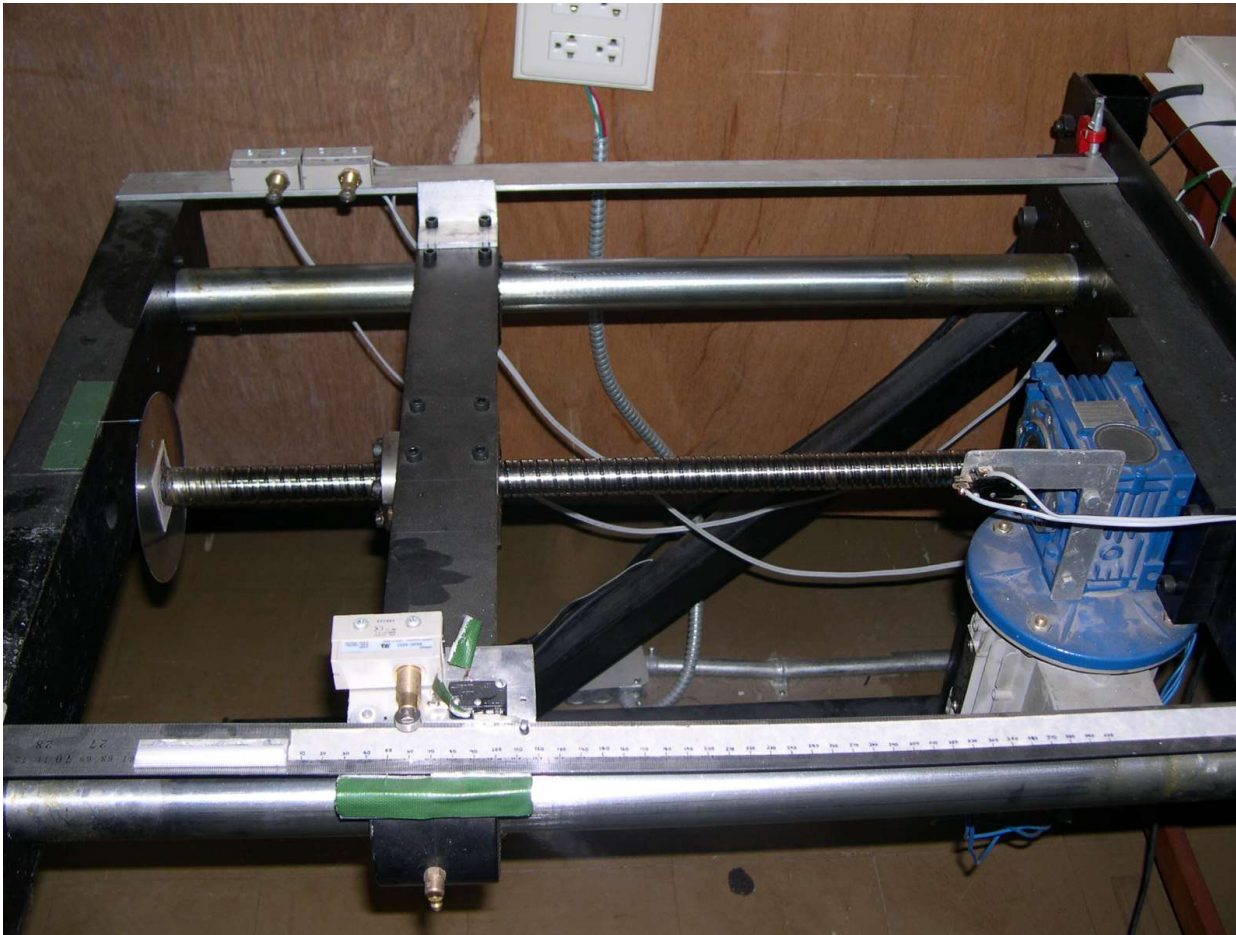


Conveyors

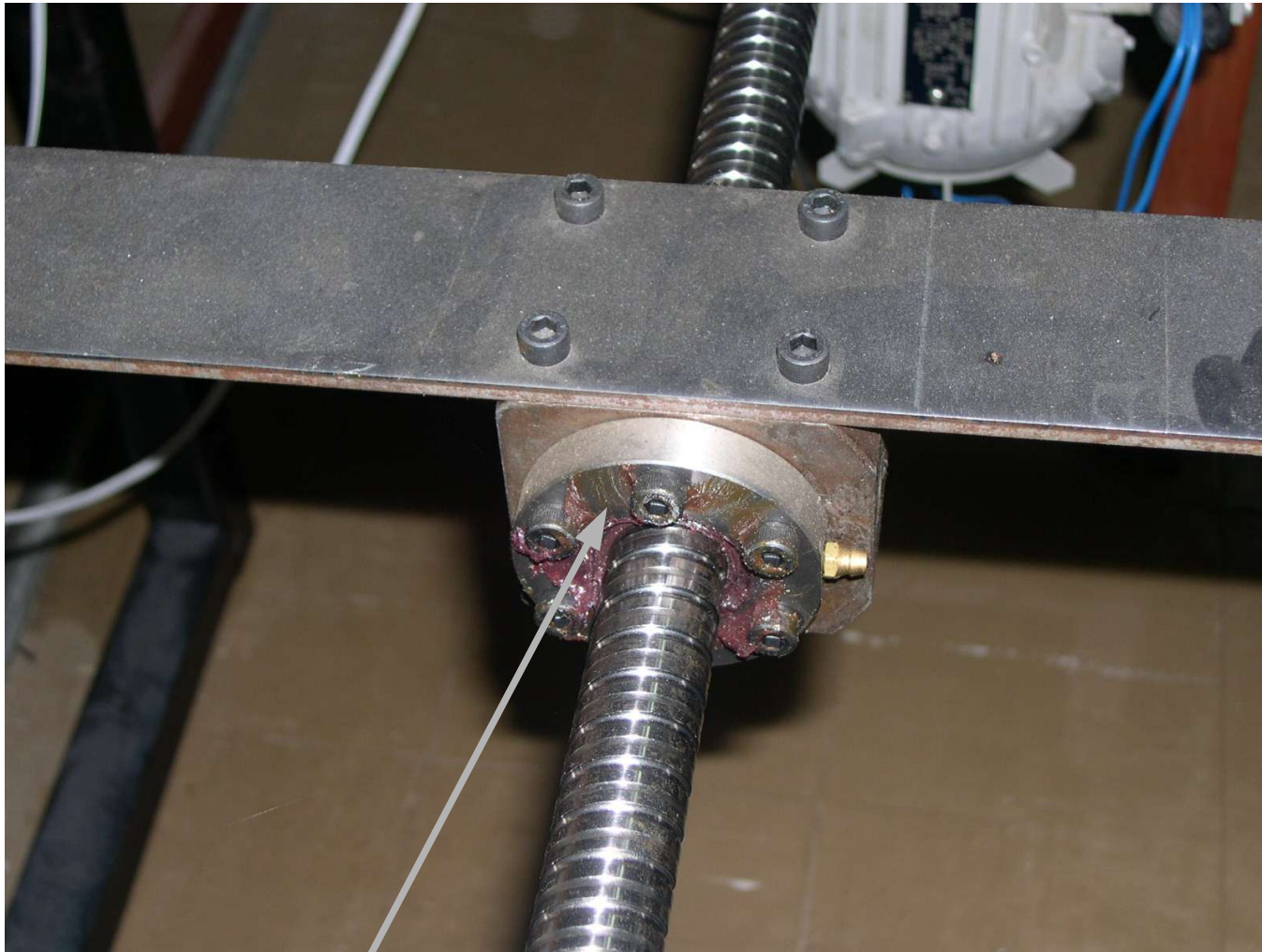


Ball Screws





Positioning system for bending machine



Ball screw

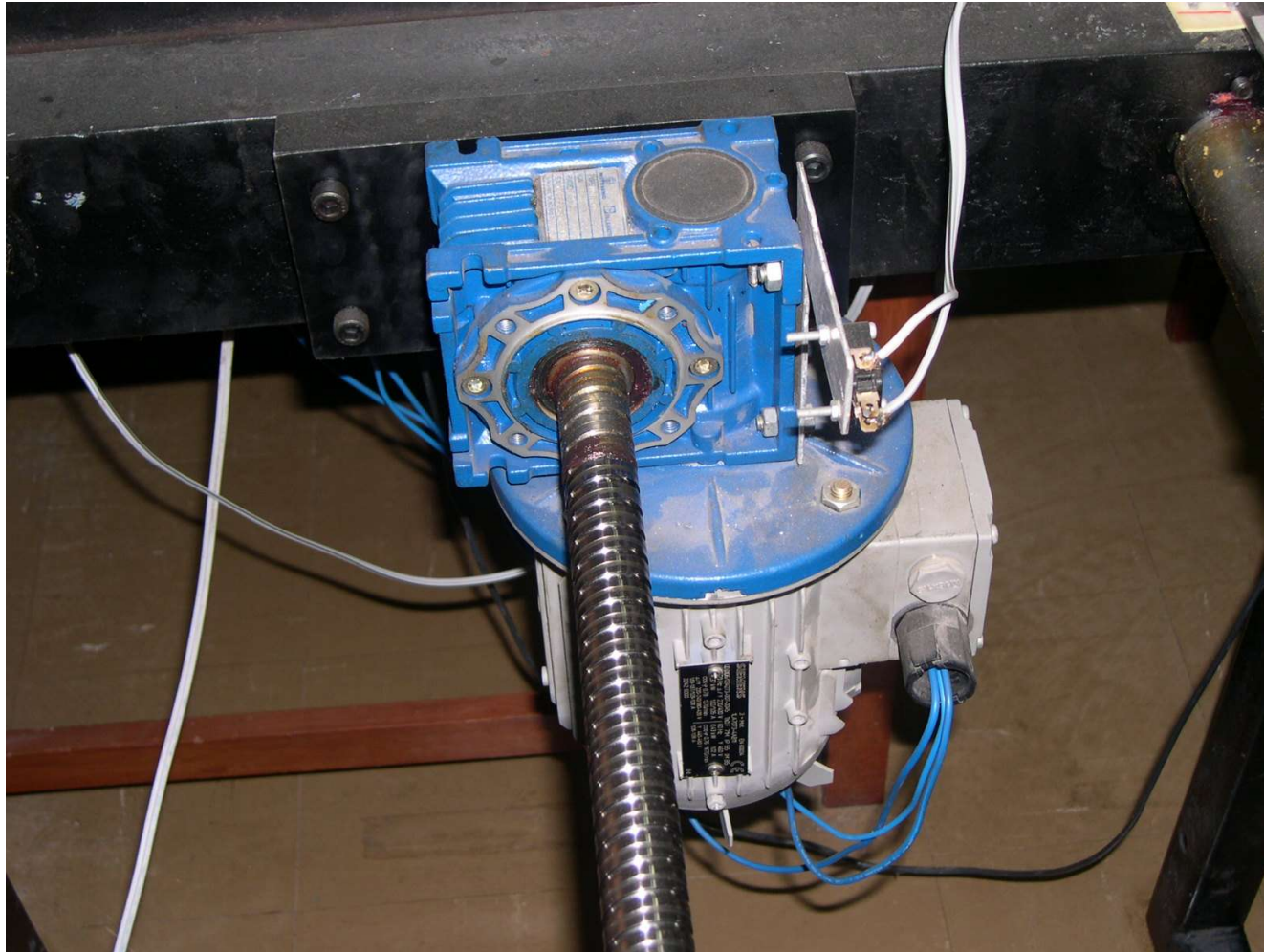
Actuator

- Electric
 - ♦ Motor AC or DC
- Hydraulic
 - ♦ Pump
 - ♦ Cylinder
 - ♦ Valve (Proportional, Servo)
- Pneumatic
 - ♦ Pump
 - ♦ Cylinder
 - ♦ Valve (Proportional, Servo)



Motors





3 phase AC motor with gear



DC motor with gear

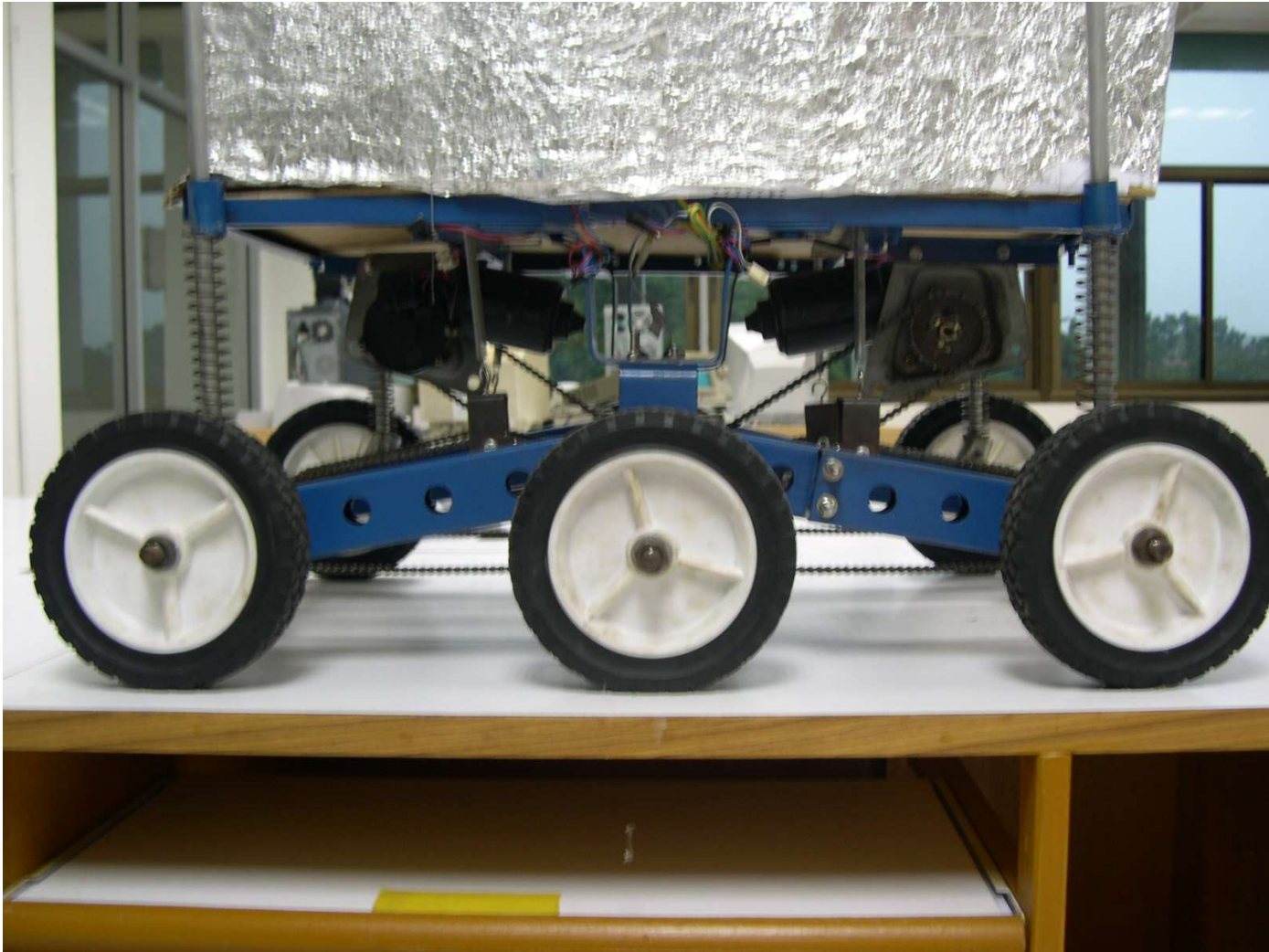


DC motor : Rotor, Stator and Gear box

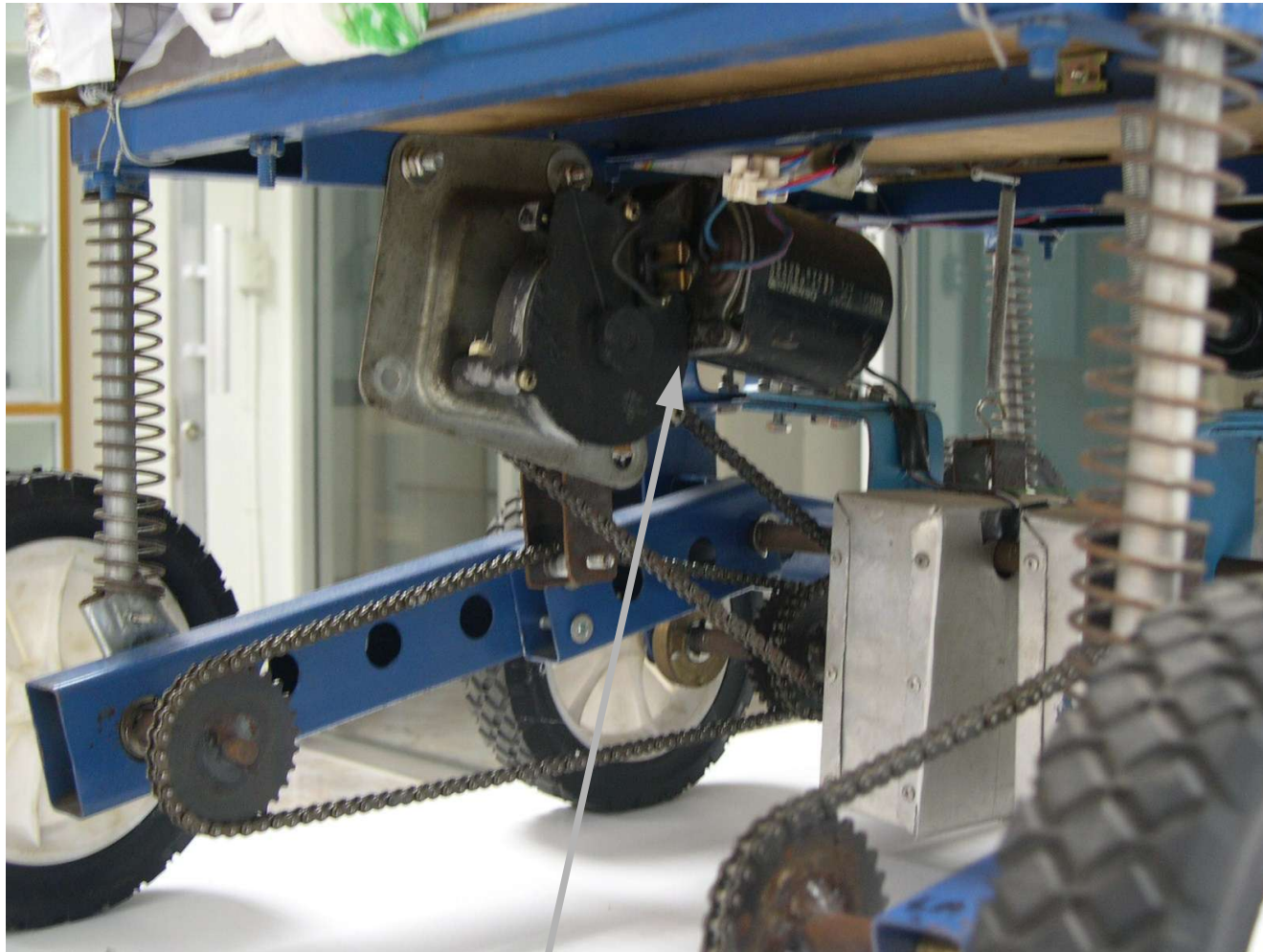


Rotor of DC Mortor





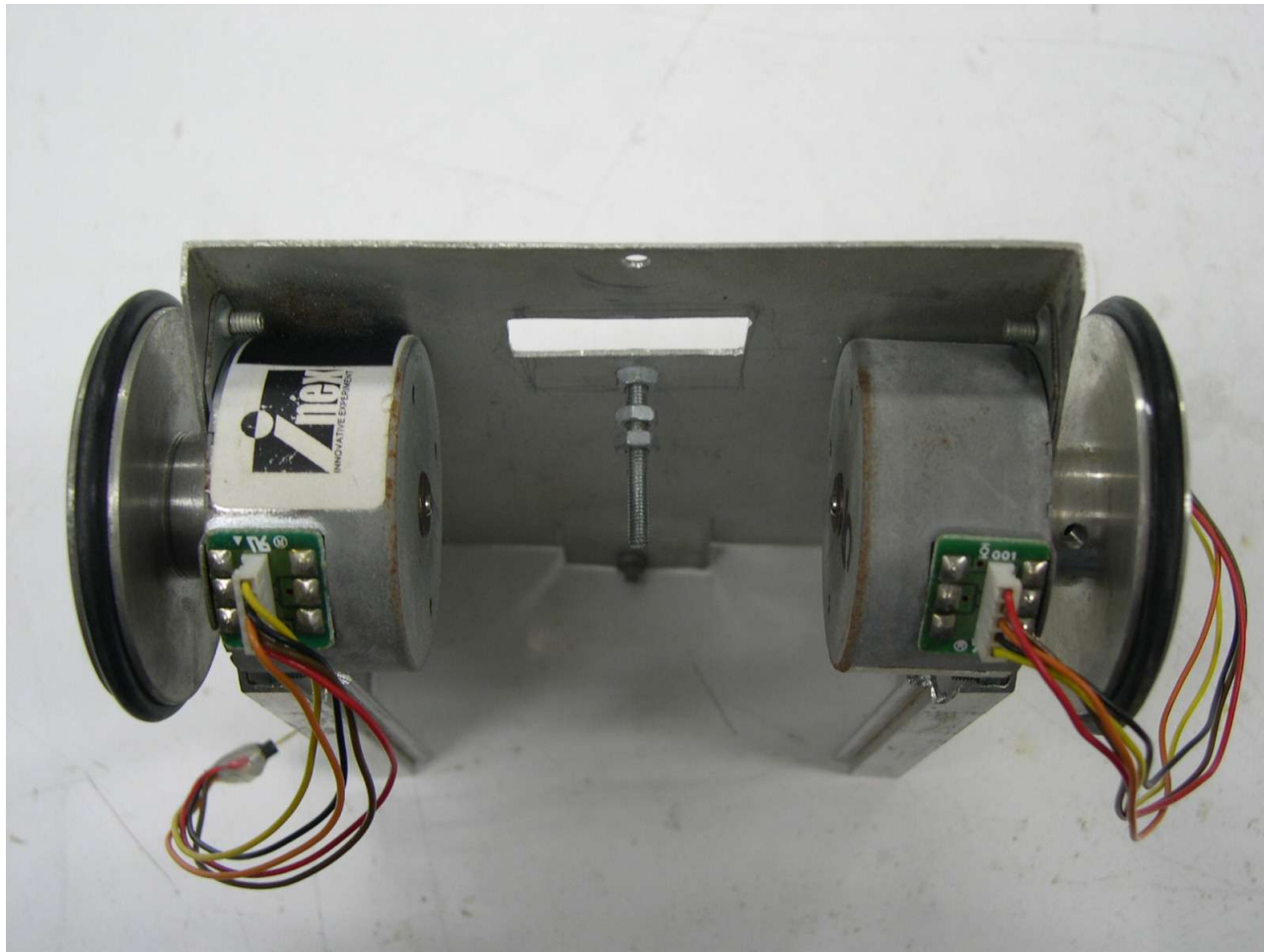
6-wheels Robot



DC motor with gear

Servo Motors





Stepping motor

Linear Actuators



Pneumatic System



Pneumatic Materials

airtec Germany
PNEUMATIC EQUIPMENT
- All kinds of Air Cylinder
- Solenoid Valves
- Mechanical Valves
- Service Units (FRL)
- Tube & Fitting

ROSS
Worldwide INDUSTRIAL AIR VALVE...SOLENOID VALVE POPPET & LAP SPOOL TYPE, DOUBLE VALVE FOR METAL STAMPING PRESS CLUTCH/BRAKE

mecair
TODAY'S CLEANING SYSTEM TECHNOLOGY
- AIR-BLOWING VALVE FOR DUST COLLECTION SYSTEM, VARIOUS CONNECTIONS, TUBING, FLANGE, WIPERS, KNUCKLE, ETC.
- AUTOMATIC REGULATION
- OVERHEATING
- EFFICIENT, PRESSION MONITOR
- REMOVAL, ECONOMY AND
- IN OPERATION
- WATER CONTROL

Easier Application
The frequency inverter on the Digitec provides easy speed control. The Digitec makes it possible to copy and modify.

Easier Maintenance
The SCIMMY inverters have easy-to-use design that can be easily mounted or dismounted.

International Standard
Standard models meet CE and UL. SCIMMY Series includes three-phase 200V models and three-phase 400V compatible with a wide variety of power.

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TRISAK AUTO

Pneumatic Systems



Bearing

- Ball bearing
- Cylinder
- Wall

Bearing



Coupling

- Clutch
 - ◆ Mechanic
 - ◆ Electric



Clutch



Clutch



Sensors

- Mechanics
- Light and Optics
- Pressure
- Wave
- Etc.



An Example of Sensing Device

- Potentiometer
- Infra-red
- Strain gauge
- Magnetic
- Optic Fibre



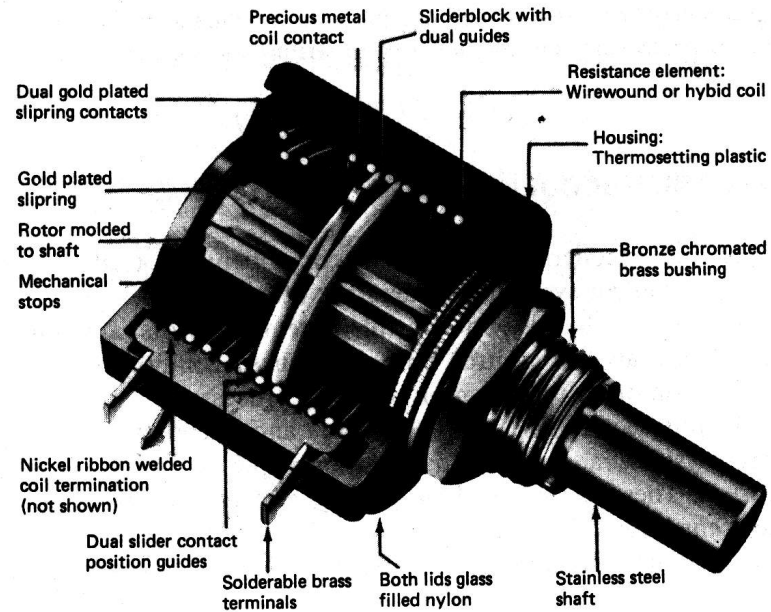


Figure 4-25 Ten-turn rotary potentiometer. (Courtesy of Helipot Division of Beckman Instruments, Inc.)

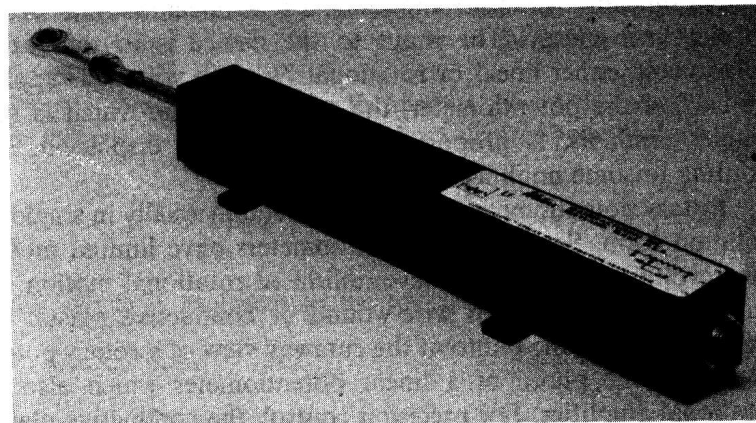
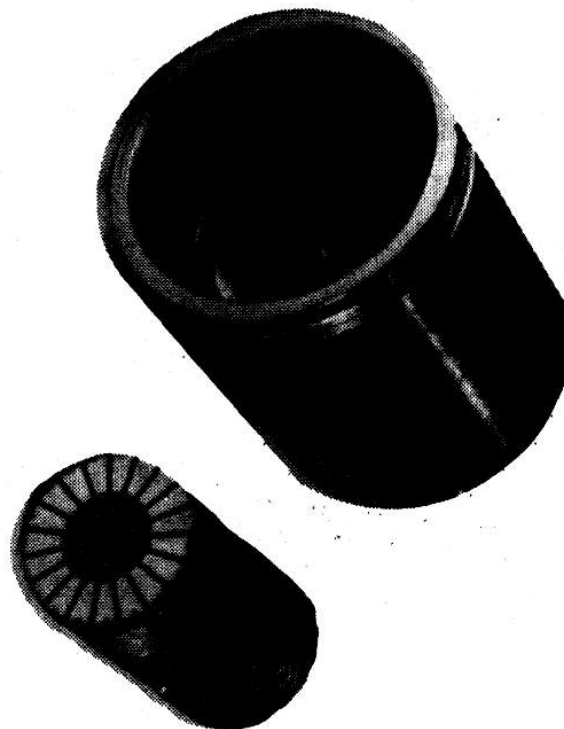
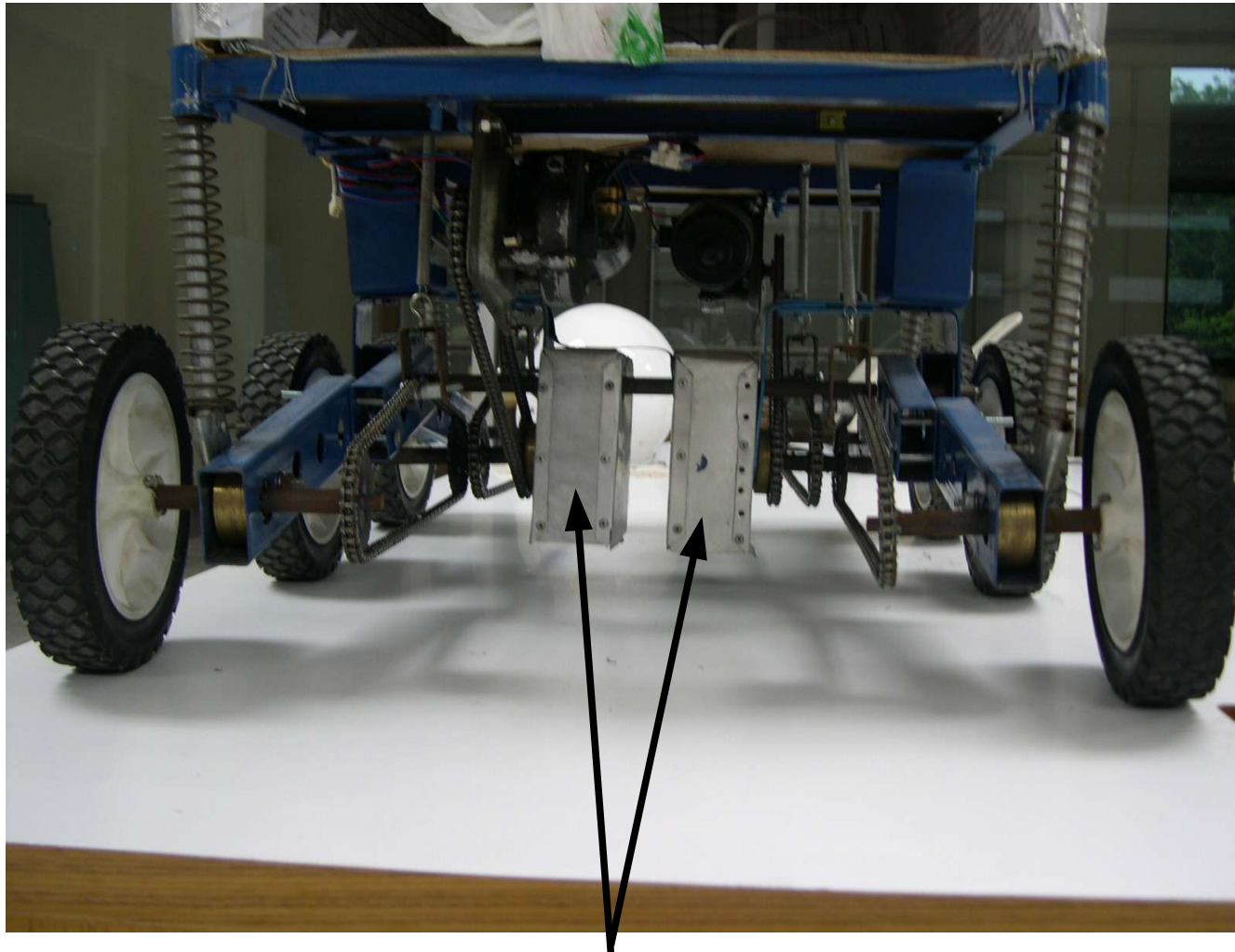


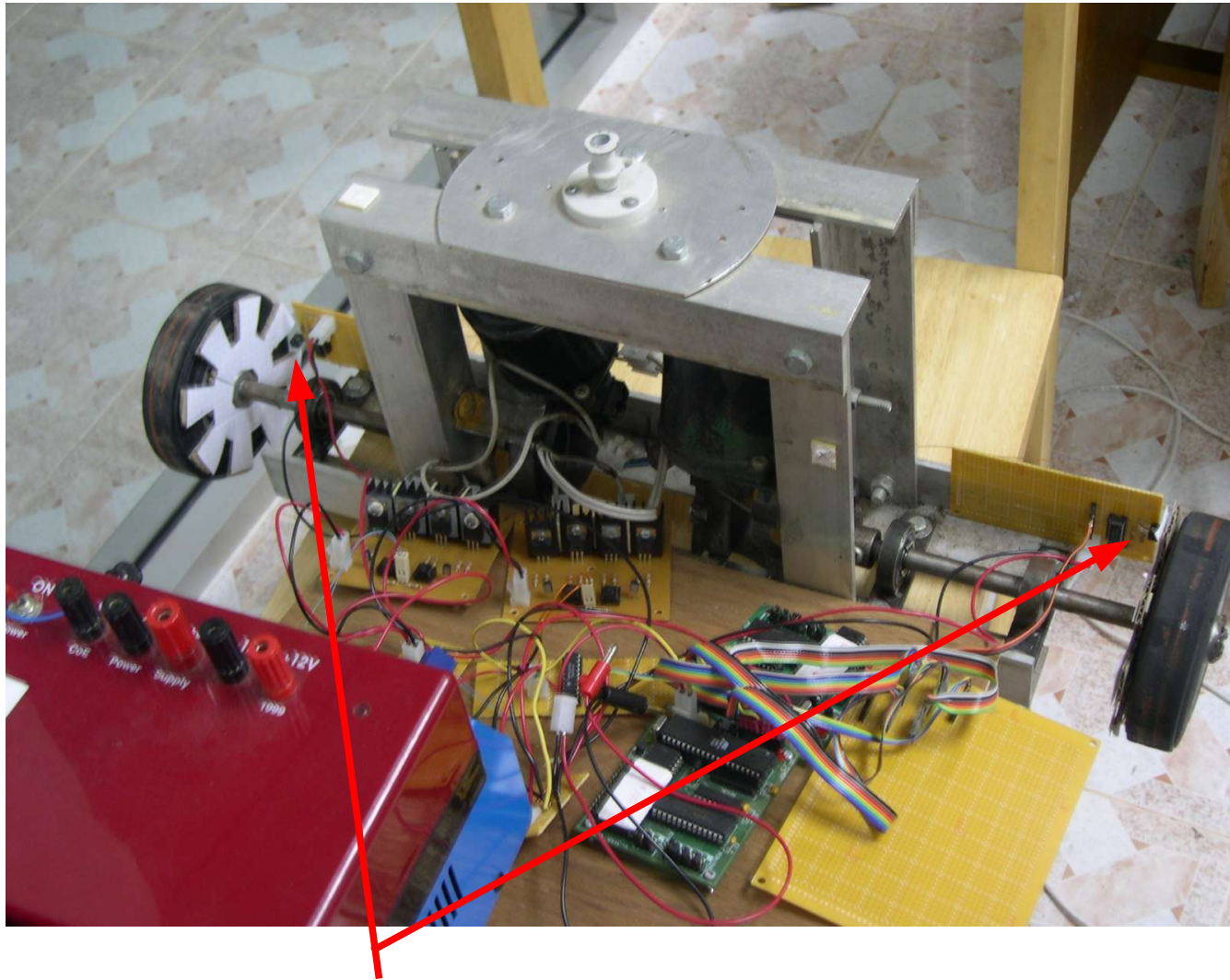
Figure 4-26 Linear motion potentiometer with built-in operational amplifier. (Courtesy of Waters Manufacturing, Inc.)

Figure 4-39 Low-inertia moving-coil tachometer armature, housing-and- magnet assembly.





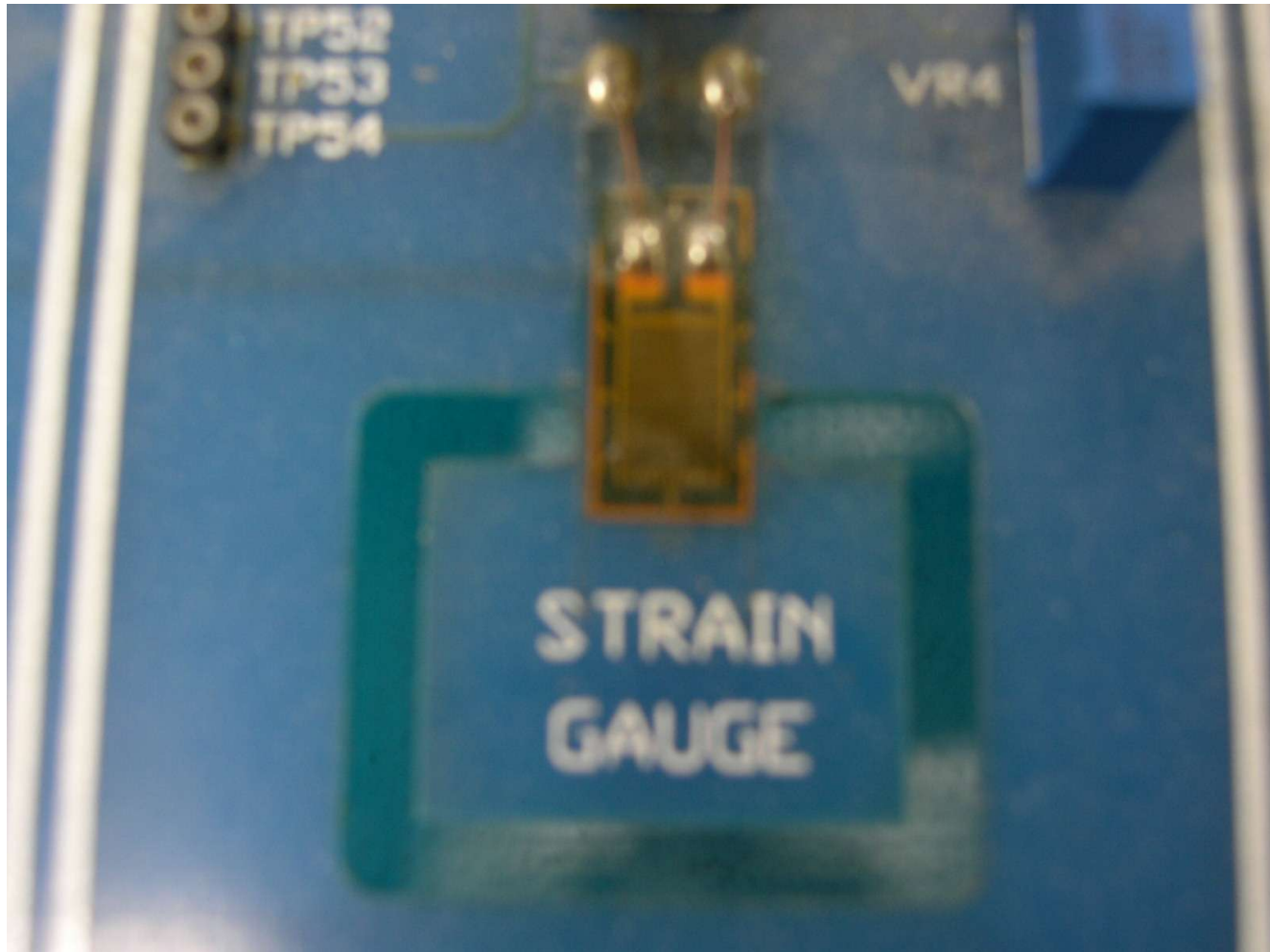
Infra-red Position Sensor



Infra-red Position Sensor

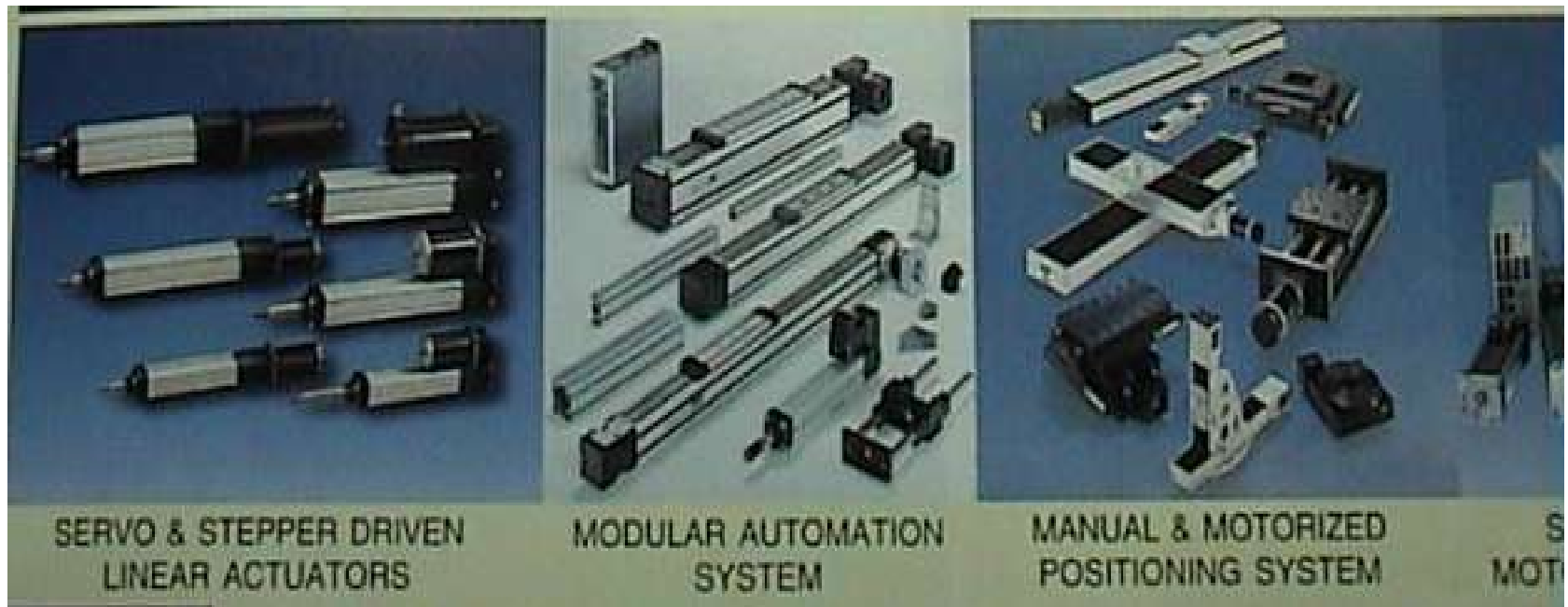


Encoder



Strain Gauge

Linear Scale



Thermal and Pressure Gauge



