Week 4

1. Engineers' Salary Survey
2. Design project (see Design Project Schedule on web)
3. Professionalism and Ethics (chapter 1.10 in book)

Engineering Salary Survey

Source: http://www.abbott-langer.com/asmesumm.html?pn02

Engineering Salary Survey

The median annual income reported in a recent survey (2004) of the compensation of mechanical engineers was $83,236 , with the middle 50% falling between $62,000 and $100,000, according to Dr. Steven Langer, President of Abbott, Langer & Associates, Inc., Crete, IL.

Engineering Salary Survey, cont'd

The composite highest-income practitioner in this field (salary plus cash bonus and/or cash profit sharing) is the Research Vice President/Director with a median income of $135,000. Far toward the other end of the income spectrum, Junior Engineers have a median annual income of $50,000.

Engineering Salary Survey, cont'd

The median total cash compensation of some included in the 2002 survey report are:

Presidents "B“	$130,500
Engr. Directors/Vice Presidents	$110,000
Professors	$106,700
Principal Consultants	$100,000
Environmental Managers	$96,990
Senior Engineers	$79,800
Sales Representatives	$74,000

Engineering Salary Survey, cont'd

Compensation varies considerably. Median incomes are highest for independent consultants ($99,500), and in financial organizations ($118,000), textile mill product manufacturing ($96,000), and petroleum/coal/natural gas extraction & refining firms ($95,000);

Engineering Salary Survey, cont'd

Median incomes are lowest in firms manufacturing home appliances ($63,000) and circuit boards ($63,500), printing firms ($63,800), and state government ($64,000).

Engineering Salary Survey, cont'd

When level of education is taken into account, mechanical engineers with a **doctoral degree** earn a median annual income of $93,750, 32% higher than those with a bachelor's degree ($70,950).

Mechanical engineers with **under one year of experience** have a median income of $49,900, only about one-half that of the 25-plus-year veteran ($100,000).

Chapter 1.9
Engineering Education

Some personal observations:

- Observe market trends continuously.

Internet job sites are an excellent resource.

- The highest demand is typically in new technologies (often the most interesting, but also the most challenging)

About Week 3 Lab Assignment:

Begin Literature Search

Your Sources:

- **Library**
- **Web**
- **US Patent office**

US Patent example:

United States Patent 6,491,566
Peters , et al.
December 10, 2002

‘Toy Robots’
Legally known as:
“Sets of toy robots adapted to act in concert, software and methods of playing with the same “

US Patent 6,491,566

US006491566B2

(12) **United States Patent**
Peters et al.

(10) **Patent No.: US 6,491,566 B2**
(45) **Date of Patent: Dec. 10, 2002**

(54) **SETS OF TOY ROBOTS ADAPTED TO ACT IN CONCERT, SOFTWARE AND METHODS OF PLAYING WITH THE SAME**

(75) Inventors: **Geoffrey W. Peters**, Hillsboro, OR (US); **Aaron B. Weast**, West Linn, OR (US)

(73) Assignee: **Intel Corporation**, Santa Clara, CA (US)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 30 days.

(21) Appl. No.: **09/817,707**

(22) Filed: **Mar. 26, 2001**

(65) **Prior Publication Data**

US 2002/0137427 A1 Sep. 26, 2002

(51) **Int. Cl.**[7] **A63H 30/00**
(52) **U.S. Cl.** **446/454**; 463/58
(58) **Field of Search** 463/1, 58; 446/454–456

(56) **References Cited**

U.S. PATENT DOCUMENTS

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5,766,077	A *	6/1998	Hongo	273/148 B
6,247,994	B1 *	6/2001	DeAngelis et al.	446/454
6,254,486	B1 *	7/2001	Mathieu et al.	446/175
6,280,286	B1 *	8/2001	Andrews	446/269
6,289,263	B1 *	9/2001	Mukherjee	7000/245
6,290,565	B1 *	9/2001	Galyean, III et al.	273/148 B

* cited by examiner

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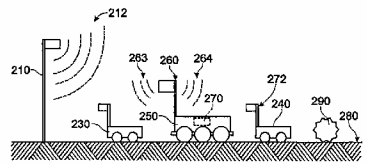
Assistant Examiner—John M Hotaling, II
(74) *Attorney, Agent, or Firm*—Blakely, Sokoloff, Taylor & Zafman LLP

(57) **ABSTRACT**

Toy robots are provided that act in concert with each other. A player issues high level team commands to a processor. The processor interprets the team command to derive individual low level commands for the toy robots. A transmitter transmits the low level commands to the toy robots, which then act in concert.

45 Claims, 4 Drawing Sheets



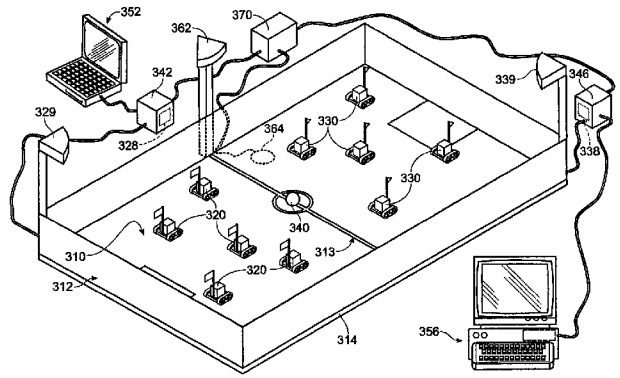


Fig. 1

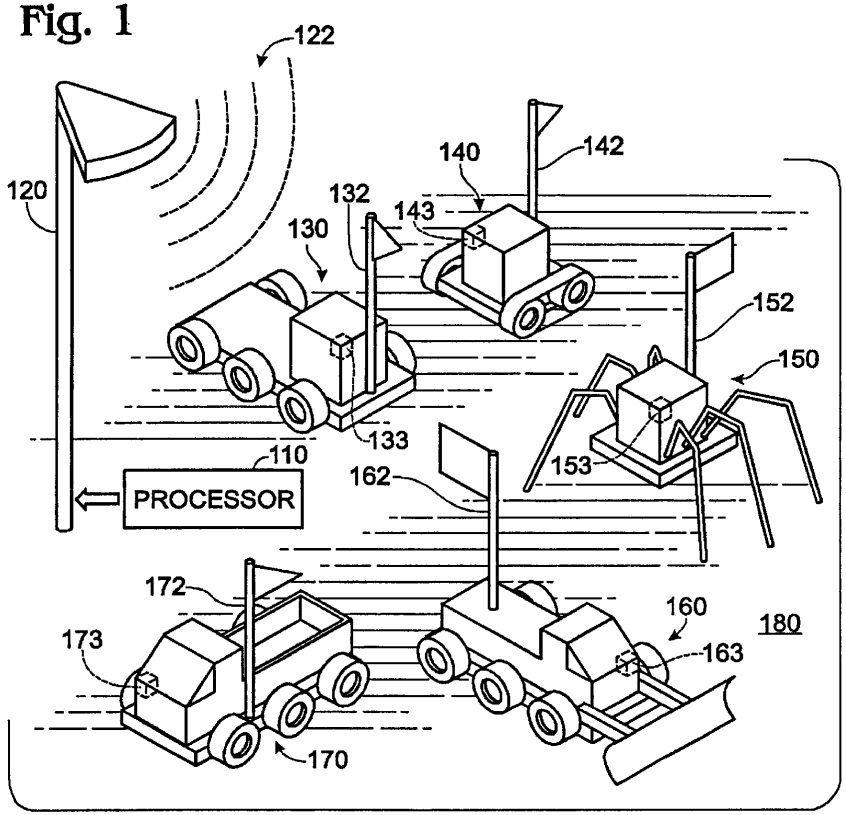

122
120
140
142
132
143
130
152
150
133
110
PROCESSOR
162
153
172
160
180
173
163
170

Fig. 2

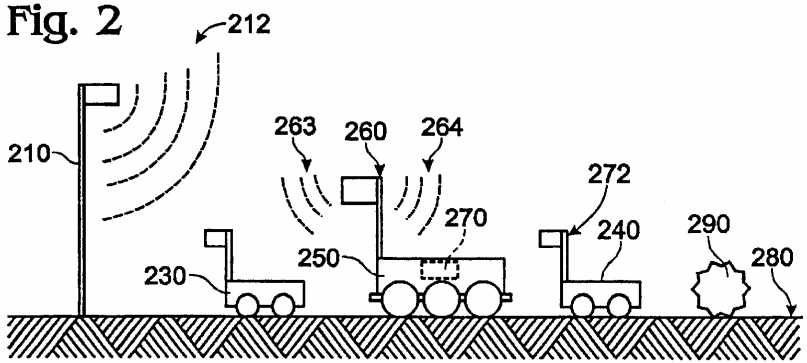

212
210
263
260
264
272
270
240
290
250
230
280

Fig. 4

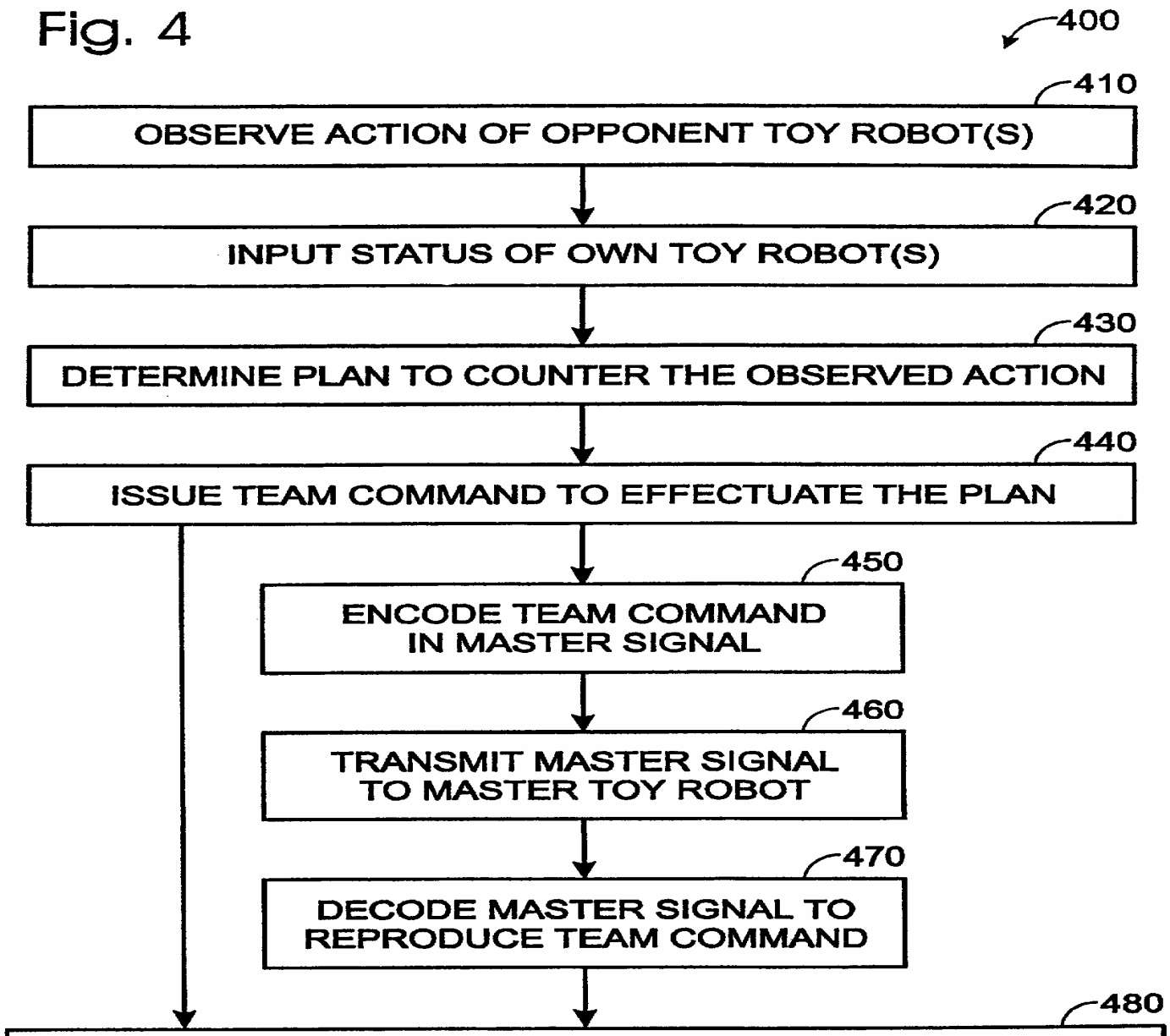
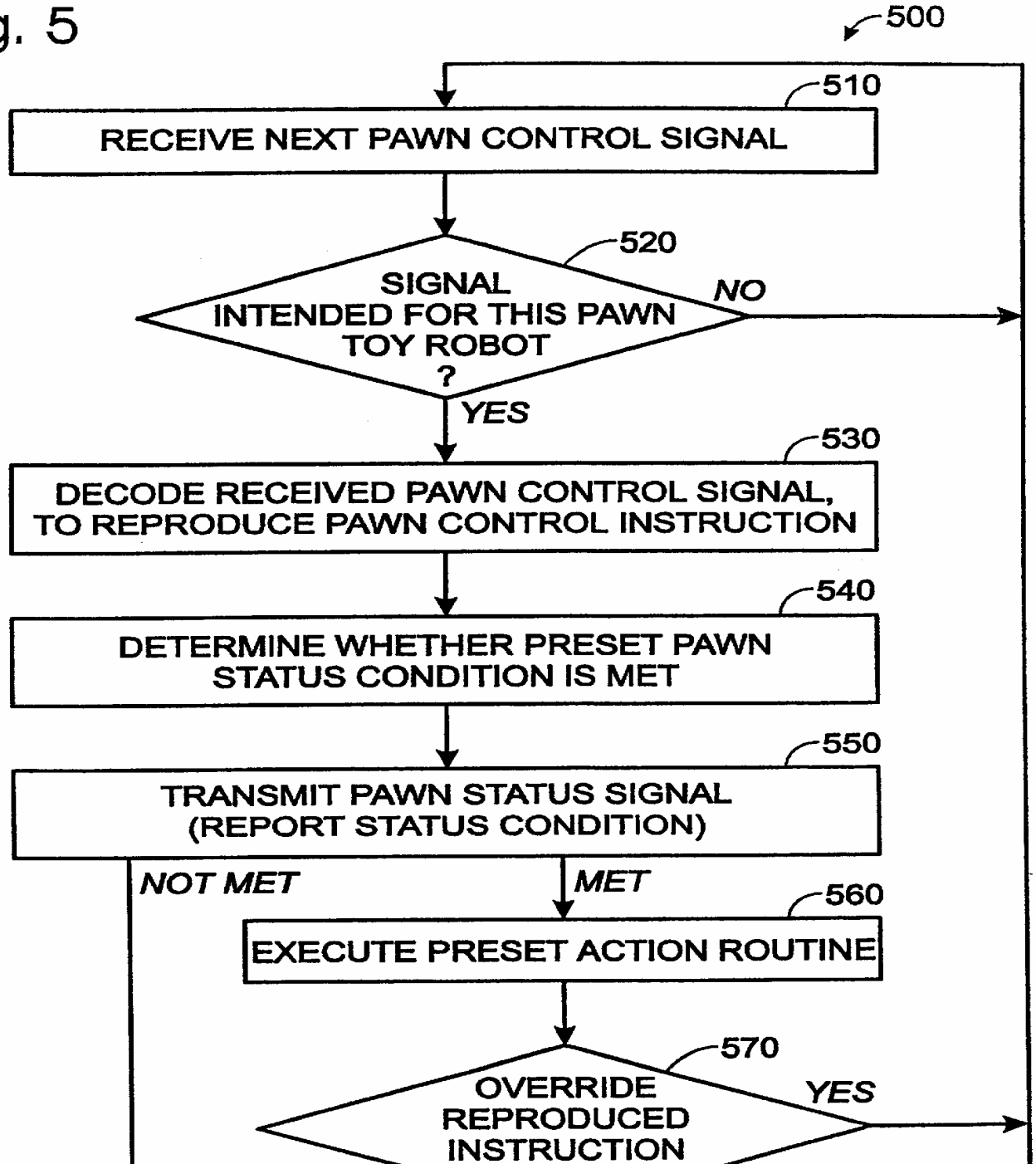

400
410
OBSERVE ACTION OF OPPONENT TOY ROBOT(S)
420
INPUT STATUS OF OWN TOY ROBOT(S)
430
DETERMINE PLAN TO COUNTER THE OBSERVED ACTION
440
ISSUE TEAM COMMAND TO EFFECTUATE THE PLAN
450
ENCODE TEAM COMMAND IN MASTER SIGNAL
460
TRANSMIT MASTER SIGNAL TO MASTER TOY ROBOT
470
DECODE MASTER SIGNAL TO REPRODUCE TEAM COMMAND
480

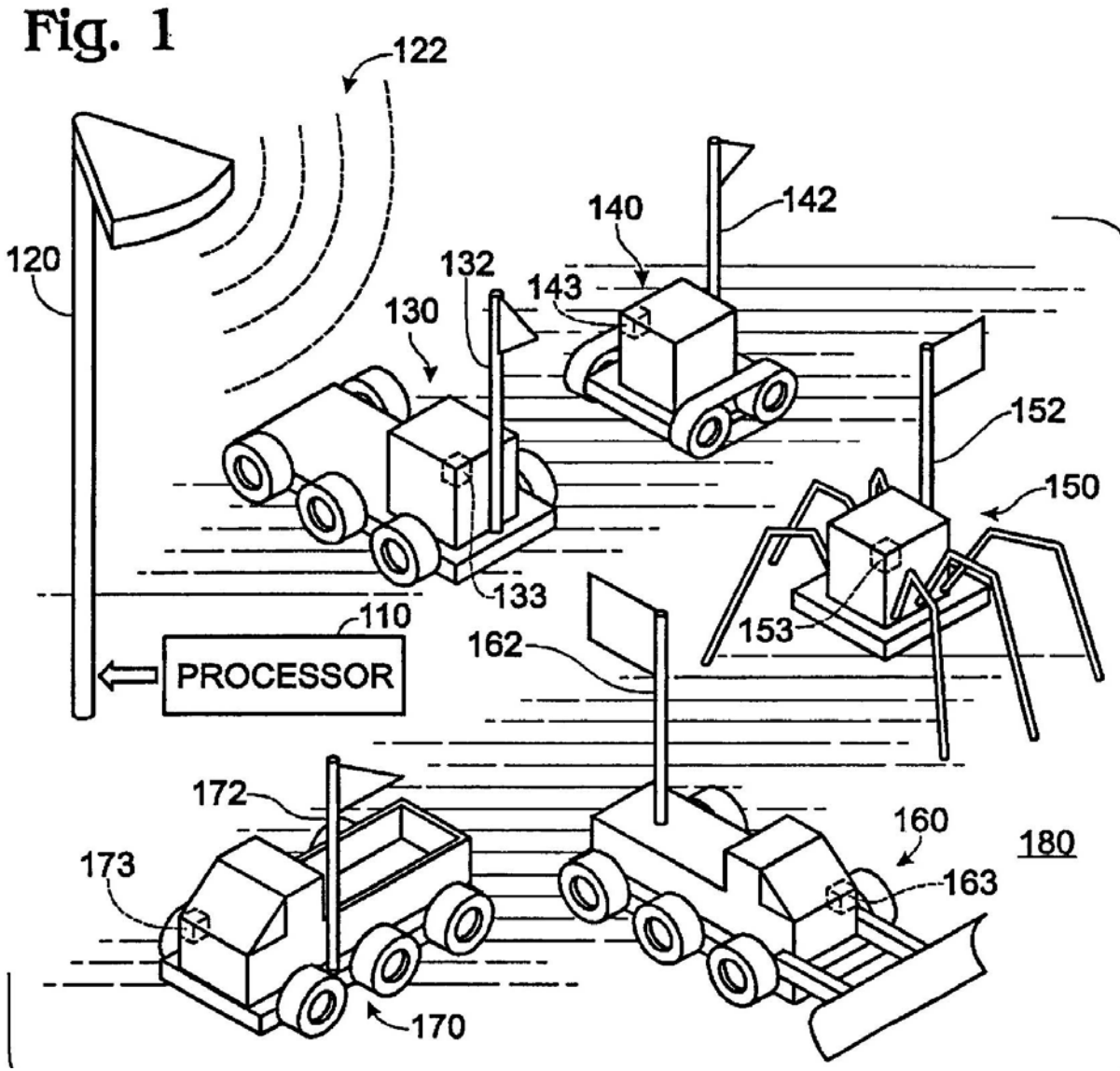
Fig. 5


500
510
RECEIVE NEXT PAWN CONTROL SIGNAL
520
SIGNAL INTENDED FOR THIS PAWN TOY ROBOT ?
NO
YES
530
DECODE RECEIVED PAWN CONTROL SIGNAL, TO REPRODUCE PAWN CONTROL INSTRUCTION
540
DETERMINE WHETHER PRESET PAWN STATUS CONDITION IS MET
550
TRANSMIT PAWN STATUS SIGNAL (REPORT STATUS CONDITION)
NOT MET
MET
560
EXECUTE PRESET ACTION ROUTINE
570
OVERRIDE REPRODUCED INSTRUCTION
YES

What can we learn?

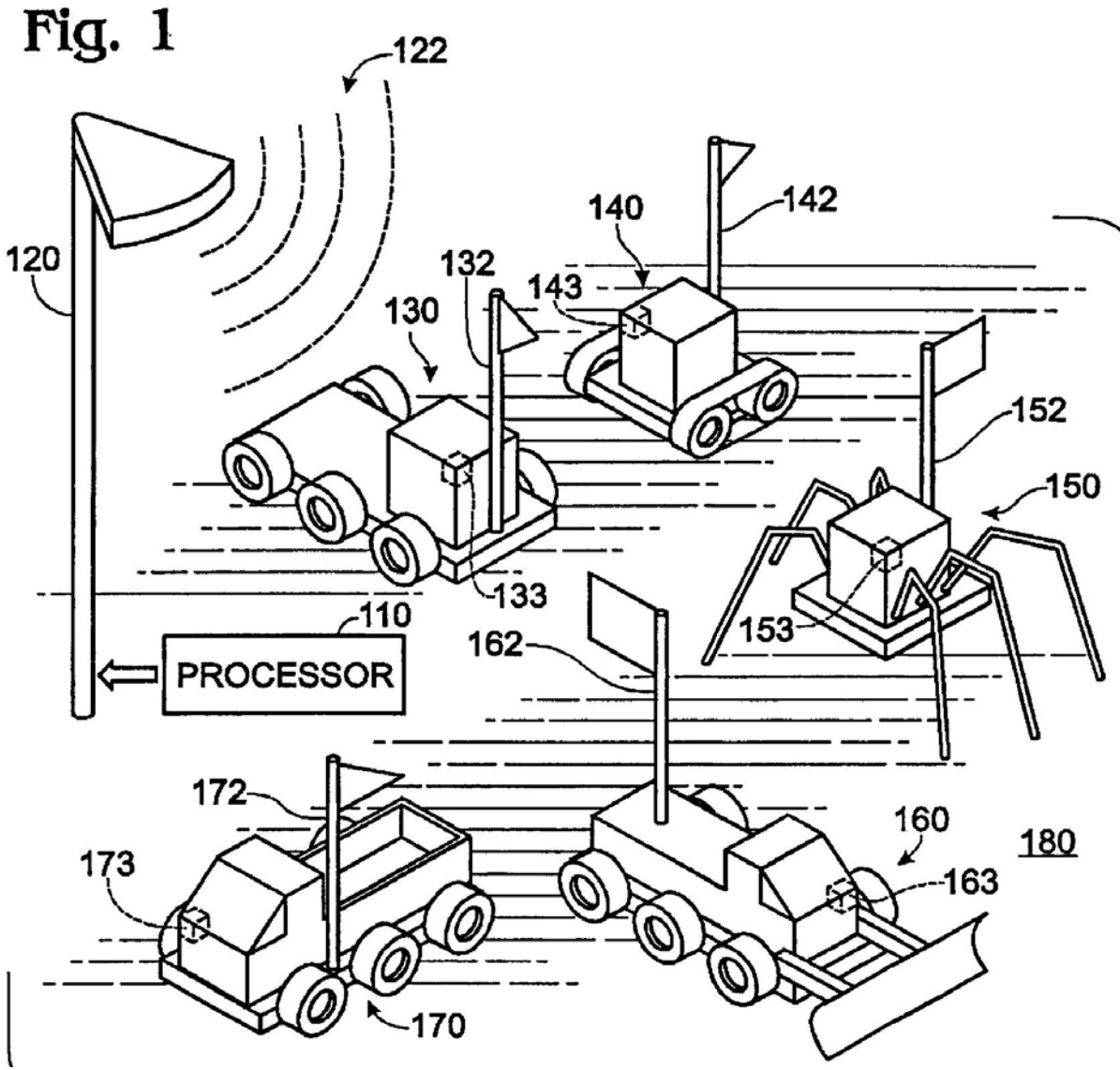
Creativity?

New Ideas?



Conclusion

Patents are an excellent resource for assessing the state of the art, and for generating new ideas.



Lab Assignment:

Begin Literature Search

Your Sources:

- **Library: Visit the UNLV Library.**

The library has an on-line catalog. See:

http://www.library.unlv.edu/

- **Web**
- **US Patent office**

Lab Assignment:

Begin Literature Search

Your Sources:

- Library
- **Web**

Use search engines such as Google.
Also use Image search options

- **US Patent office**

A final remark:

Motivation: Study patents and literature for your own benefit. You will come up with new ideas. Knowledge will make you an expert, and will let you enjoy the project a lot more.

Chapter 1.10 Professionalism

Professional Registration

NEVADA STATE BOARD
OF PROFESSIONAL ENGINEERS AND LAND SURVEYORS
1755 East Plumb Lane, Suite 135, Reno, Nevada 89502
(775) 688-1231 1-800-728-2632 (In Nevada only)

Application for Professional Engineer Licensure

(Discipline) .....

☐ **Reciprocity** (Fee $200)

☐ **Exam** (Fee $225 – Structural see Fee List)

The Appropriate Application Fee Must Accompany This Application

Nevada State Board of Professional Engineers and Land Surveyors

1755 E. Plumb Lane, Suite 135 Reno, NV 89502

Applicant's name: _____

Address: _____

_____

is seeking licensure as a (discipline) _____ Engineer in Nevada and has sent you this request for a professional reference. We understand that you are a Licensed Professional Engineer (license may be in any state) and have personal knowledge of the applicant's engineering work, character and ethics. Please complete, sign, then stamp or seal this form. Place it in an envelope; seal and sign the envelope according to the instructions, then return the envelope to the Board office. ***This Reference is confidential*** and will not be accepted by the Board if not properly completed as instructed. *THE NEVADA BOARD HAS ON FILE A NOTARIZED AFFIDAVIT RELEASING ALL REFERENCES, EMPLOYERS AND FORMER EMPLOYERS, NAMED BY THE APPLICANT, FROM ALL LIABILITY FOR ANY DAMAGE WHATSOEVER FOR GIVING INFORMATION AS REQUIRED ON THIS FORM.*

Applicant: *Describe up to 3 projects you had full or partial responsibility for while working with this professional engineer. Include dates, locations, and descriptive statements defining design work performed. (Attach an additional sheet if more space is needed)*

(1) _____

_____

_____

What is a ‘Professional Engineer (PE)?

Licensing
Obligations

What is a ‘Professional Engineer (PE)?

By acquiring a license from its State Board, a Professional Engineer meets a set of minimal requirements for practicing the engineering profession in his/her field.

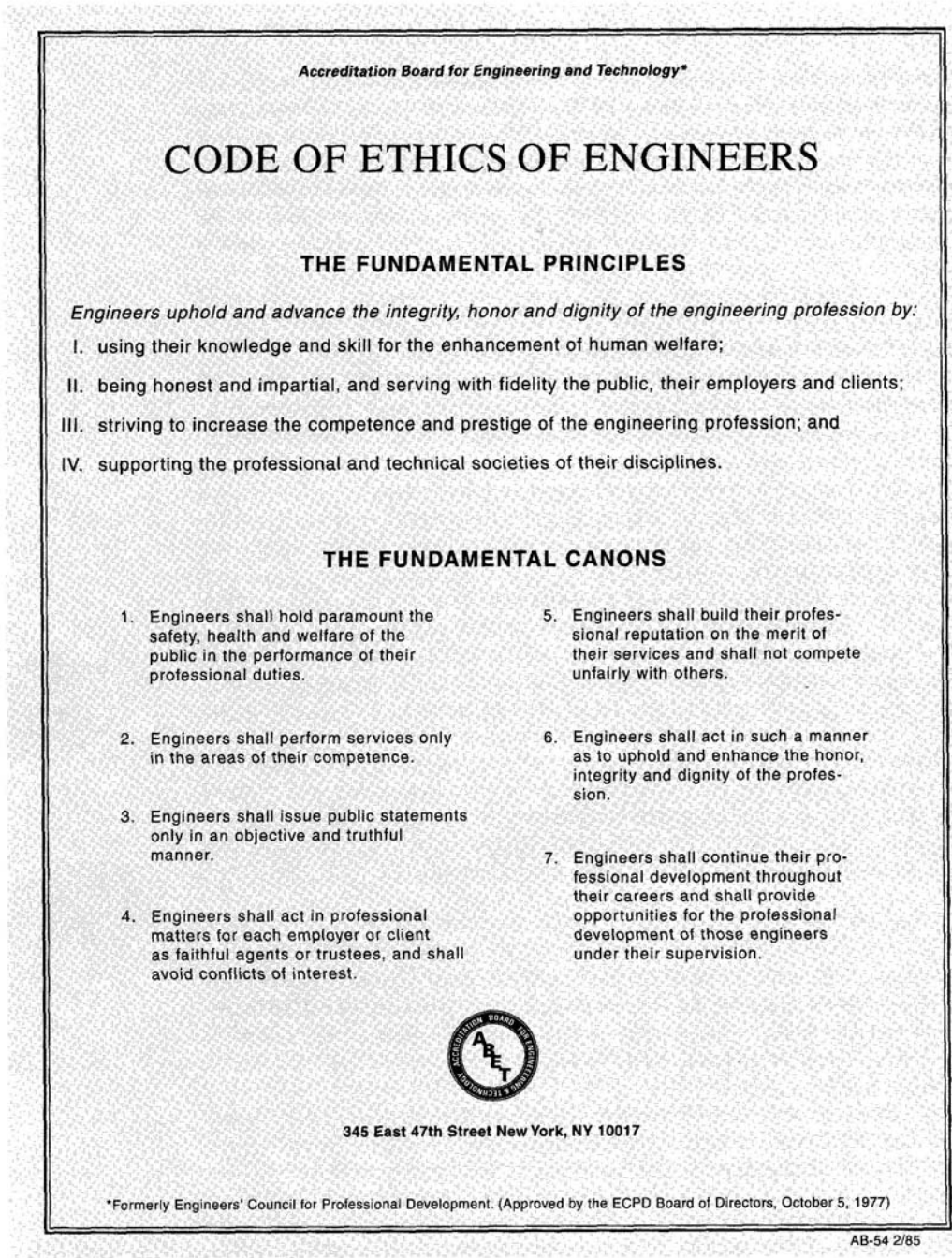
What is a ‘Professional Engineer (PE)?

Obligations: As other licensed professionals, the PE must protect the ‘safety, health, and welfare of the public’

Caution: Your PE stamp of approval makes you legally responsible for the safety of the design bearing your signature. As you shall see, this is a significant responsibility.

Source: Page 70 of your textbook

Figure 1.35



*Accreditation Board for Engineering and Technology**

CODE OF ETHICS OF ENGINEERS

THE FUNDAMENTAL PRINCIPLES

Engineers uphold and advance the integrity, honor and dignity of the engineering profession by:

I. using their knowledge and skill for the enhancement of human welfare;

II. being honest and impartial, and serving with fidelity the public, their employers and clients;

III. striving to increase the competence and prestige of the engineering profession; and

IV. supporting the professional and technical societies of their disciplines.

THE FUNDAMENTAL CANONS

1. Engineers shall hold paramount the safety, health and welfare of the public in the performance of their professional duties.
2. Engineers shall perform services only in the areas of their competence.
3. Engineers shall issue public statements only in an objective and truthful manner.
4. Engineers shall act in professional matters for each employer or client as faithful agents or trustees, and shall avoid conflicts of interest.
5. Engineers shall build their professional reputation on the merit of their services and shall not compete unfairly with others.
6. Engineers shall act in such a manner as to uphold and enhance the honor, integrity and dignity of the profession.
7. Engineers shall continue their professional development throughout their careers and shall provide opportunities for the professional development of those engineers under their supervision.

345 East 47th Street New York, NY 10017

*Formerly Engineers' Council for Professional Development. (Approved by the ECPD Board of Directors, October 5, 1977)

AB-54 2/85

Code of Ethics for Engineers. (*Accreditation Board for Engineering and Technology*)

The End