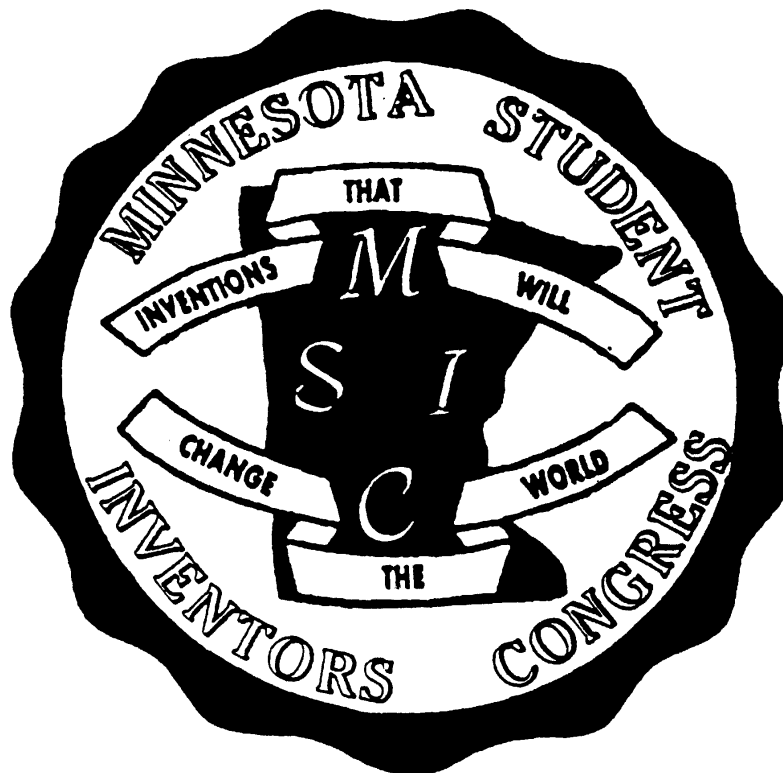


# NORTHEAST SERVICE COOPERATIVE

## MINNESOTA STUDENT INVENTORS CONGRESS



### STUDENT HANDBOOK

SPONSORED BY:

NORTHEAST SERVICE COOPERATIVE

**This handbook is to help you to know all the things  
you need to know  
about bringing an invention  
to the Inventor's fair.**

**If you have more questions,  
ask your mom or dad or your teacher.**

**Have fun with this handbook  
and  
have fun with your invention!**



# MINNESOTA STUDENT INVENTORS CONGRESS

## REGIONAL COMPETITION

FROM: KIJO PULFORD

Welcome to the MSIC (Minnesota Student Inventors Congress) – a unique project challenging the problem-solving and higher level thinking skills of students.

The Regional Competition is set for Friday, February 3, 2012 at the Miller Hill Mall, Duluth. Grades 4-12 students are eligible to participate. A local “Inventorama” is an option but not required to send students to the regional. It is hoped that everyone involved have an enjoyable and educational experience.

Students from our area attending the State Event at Redwood Falls will display their projects at the non-competitive event in June 2012, as part of MSIC’s three-day State event.

This packet of materials will provide you with information and guidelines. Should you have questions, please feel free to call me at 218-741-0750 ext 2111 or email me at [kpulford@nesc.k12.mn.us](mailto:kpulford@nesc.k12.mn.us)

**JUDGES WANTED:** If you know of adults (college students are eligible) who may be well-qualified to serve as judges and who would be willing to assist, have them fill out the form (available online). Parents and teachers are more than welcome to be judges.

**GOOD LUCK TO ALL MSIC REGIONAL PARTICIPATING SCHOOLS!**

**MINNESOTA STUDENT INVENTORS CONGRESS**  
**REGIONAL EVENT**  
**FRIDAY, FEBRUARY 3, 2012**  
**MILLER HILL MALL – DULUTH, MINNESOTA**

**INFORMATION**

1. **DUE BY JANUARY 12, 2012:** Student Information Form (includes T-Shirt order)
2. **DUE BY JANUARY 18, 2012:** All Payments and Deposit  
District Participation Data Sheet  
Certificate of Insurance

**PLEASE SEND THE ABOVE ITEMS TO:** Kijo Pulford  
Northeast Service Cooperative  
5525 Emerald Avenue  
Mt. Iron, Minnesota 55768

3. **GRADE LEVEL PARTICIPATION:** Students in grades 4-12 are invited to participate
4. **SCHEDULE – FEBRUARY 3, 2012:**

8:30 – 9:15	Registration / Project Set-up
9:15 – 11:00	Project Judging
11:00-12:00	Kids’ Choice Judging
11:30 -1:00	Lunch
1:00 - 1:30	Awards Ceremony
1:30 – 2:00	Dismantling of Projects, Pack-up and Clean-up
5. **TABLES:** Are provided – please clean-up, dismantle and return after the event
6. **SNACKS:** Students may bring a sack lunch. The Food Court in the Mall is open, and students accompanied by an adult may eat there
7. **UNLOADING/PARKING:** Projects will be unloaded at a Mall entry to be announced. The MSIC Coordinator will hand out packets for the day to advisors as they enter. Parking is in the Mall parking areas.
8. **PROPER DISPLAY:** For a student to receive a certificate and be eligible for State, the invention must be displayed and described to the judges.

**KIDS RECOGNIZE KIDS**

The “Kids’ Choice Award” has become an exciting part of the Regional event. This award will be presented to the projects chosen by their peers to be the best. Participants will be invited to take a ballot with them as they view other projects on display the day of the event. Results will be tallied and the winners announced at the awards ceremony.

# MSIC GUIDELINES

## 1. **REGIONAL EVENT RECOGNITION:**

GRADE CATEGORIES: 4-6 and 7-12

PROJECT CATEGORIES: See explanation on the following page

STATE PARTICIPANTS: 25 projects displayed will be selected from the “Category Finalists” to be displayed at the State Event in Redwood Falls in June 2012 at the **56<sup>th</sup> Annual Minnesota Inventors Congress**. Student Inventors are requested to accompany their projects – parents are highly encouraged to attend. This is a **non-competitive** event allowing students to interact with their peer inventors, adult inventors and hundreds of visitors.

2. **LIABILITY:** Liability cuts across all grade / age levels and is a concern. The MSIC State Council expects parental accompaniment and involvement at the Regional and State Events (or that parents make such arrangements). MSIC and the Northeast Service Cooperative are not responsible for damage to projects or injury or loss. Participation at the Miller Hill Mall is dependent on each school submitting a **Certificate of Insurance** with additional insured specified.
3. **INVENTOR’S LOG:** *REQUIRED* as part of the judging process and necessary for the protection of the student’s invention - the Inventor’s Log must be displayed with the invention.
4. **PARTICIPANT ABSENTEEISM:** If an invention is displayed at the Regional and State Events with absentee representation (teacher, peer, parent, etc) and participation fees are paid, the student(s) shall receive all the benefits of participation.
5. **TEAMING:** Allowed – maximum of two (2) students per invention.
6. **USE OF ELECTRICITY:** The use of AC or DC electricity is very limited and not recommended. Advisor’s must inform the Regional Coordinator of any need by January 12, and student(s) shall provide the necessary extension cord. AC power may not be available at the State Event.
7. **BACKBOARDS:** Recommended size: 18” x 24”  
Each backboard, at a minimum, should contain the following information:  
1) Name of invention 2) Student’s name 3) School 4) Grade 5) Category
8. **PROTOCOL:** As a matter of courtesy and protocol, a student inventor is asked to stand when his/her invention is being judged.
9. **NO LIVE ANIMALS:** If an invention involves live animals (ie: animal cage), an appropriate model of the animal must be used. No nudity or pyrotechnics will be allowed.

**EXTRA SPACE REQUIRED:** Indicate need for more than usual space by January 12. Keep in mind that space allocation given is typical at the State Event.

## **NORTHEAST REGION MSIC CATEGORIES**

### **THE FOLLOWING CATEGORIES HAVE BEEN DESIGNATED FOR THE REGIONAL COMPETITION**

1. CLOTHING / HEALTH & BEAUTY AIDS (orange)
2. FOODS (white)
3. GAMES AND TOYS (purple)
4. HANDICAPPED AIDS (red)
5. HOMEWORK HELPERS (green)
6. KITCHEN AIDS / HOUSEHOLD HELPERS (pink)
7. OUTDOOR RECREATION / SPORTS (lavendar)
8. PETS (blue)
9. SAFETY (yellow)
10. TECHNOLOGY (silver)
11. MISCELLANEOUS (black)

Please register your students' inventions with a category number on the MSIC Student Registration Form under the Category Number column.

# A DOZEN WAYS TO THINK LIKE AN INVENTOR

## INVENTORS:

1. Try to find ways to improve and refine things, try to make things better, not just to find fault.
2. Look for new and different ways to solve problems.
3. Ask, “How might I ...” instead of saying, “It can’t be done because ...”
4. Look at things from new perspectives or different viewpoints.
5. Frequently ask themselves and others, “What if...” or “I wonder what would happen if...”
6. Keep an open mind and seek original or unusual possibilities.
7. Observe carefully and challenge assumptions (especially beware of what “everyone knows” or what’s “obvious”).
8. Aren’t afraid to “play” with ideas, to let one thing lead to another, and to look for new ways to combine things that aren’t usually considered together.
9. Have a great deal of persistence or task commitment, committing themselves to their work.
10. Demonstrate a great degree of confidence and trust in their own judgment and vision.
11. Avoid allowing “nay sayers” to get the best of them, even when the situation is grim and they feel discouraged.
12. Experiment with and test new ideas to make them better, more complete, or workable, and seek ways to share ideas and make life better.

TO BE A GOOD INVENTOR,  
YOU HAVE TO BE ABLE TO SCAMPER

**S**UBSTITUTE

**C**OMBINE

**A**DAPT

**M**ODIFY, **M**AGNIFY **M**INIFY

**P**UT TO OTHER USES

**E**LIMINATE, **E**LABORATE

**R**EVERSE, **R**EARRANGE

- taken from Robert F. Eberle

This technique is used to encourage fluency, flexibility, originality and elaboration, the characteristics of creative thinking.

Students can apply the technique to any object as they narrow their ideas for invention.



## STEP INTO INVENTION

- I. BRAINSTORM ideas for needed inventions
- II. IDENTIFY ONE PROBLEM for possible invention
- III. RESEARCH originality of idea
- IV. REDEFINE PROBLEM based on research
- V. TEST IDEAS AND MATERIALS for workability
- VI. EVALUATE for best solution using set criteria
- VII. PRODUCE a prototype model of the invention
- VIII. TEST the prototype
- IX. PRESENT the invention to the public
- X. ELABORATE your invention, consider marketing plans, explore patenting your idea

CONTINUE your inventive thinking with other problems!

# WHAT IS AN INVENTOR'S LOG?

Webster's Dictionary says that a LOG is:

1. part of a tree that has been cut or fallen down
2. a way to measure how fast a boat is going
3. a daily record of what happens on a ship
4. something that some cabins are made of
5. any record of progress, as in a journey or in an experiment

These are the different definitions of a log that can be found in a dictionary.

Which definition do you think is the important one to understand now?

Did you say number 5? That is the right definition for you to understand now.

## You will need to have an Inventor's Log.

### *What is an Inventor's Log?*

A record of progress, as in a journey or on an experiment, that is kept by all inventors.

### *What does it look like?*

It is a bound (not loose-leaf) notebook. The pages need to be numbered.

### *What do I put in the Inventor's Log?*

All of your ideas  
Tests that you did to see if something worked  
The results of those tests  
How your ideas have changed  
Pictures or diagrams of your work  
The record of things you bought  
A list of things that you used



## BOTH YOUR INVENTOR'S LOG AND YOUR DISPLAY BOARD SHOULD:

Tell what problem your invention solves.

Tell who will use your invention.

Tell what makes your invention different or unique.

### WHO CAN HELP ME?

Mom or Dad

Teachers in your school

Custodian at your school

People who fix things

People who have hobbies that are interesting to you

Your friends

Your brother or sister

A librarian

### WHAT KIND OF HELP CAN THEY GIVE?

You can talk about ideas with anyone.

You must have adult help to use sharp or dangerous tools while building something.



WHAT ELSE DO I NEED TO THINK ABOUT FOR MY INVENTOR'S LOG?



**WRITE NEATLY**

(Someone else might want to understand how you came up with such a great idea)

**BE AS ACCURATE AS POSSIBLE**

(For example, "Added 1 cup of salt" is better than "Added some salt")

**DON'T ERASE OR COMPLETELY BLACK ANYTHING OUT**

(Just draw a line through it because then you won't forget your first idea, which might be the best idea)

**PUT YOUR INITIALS AND THE DATE EACH TIME YOU MAKE AN ENTRY**

(This will help show that the ideas and work are your ideas and your work)

**ASK SOMEONE-NOT YOUR FAMILY-TO SIGN YOUR LOG FROM TIME TO TIME**

(Add something like "read and understood by \_\_\_\_\_ on \_\_\_\_\_ {date}")

***LOOK, I MADE A PYRAMID! AM I AN INVENTOR?***

No, inventions have to be something new or a big improvement on something old.  
Pyramids are very, very old.



## WHAT IS A DISPLAY BOARD?

It is a big piece of heavy paper or poster board, recommended size is 18" x 24".

- Many display boards are folded at each end to stand by themselves.  
Set up your invention in front of the display board.

## WHAT GOES ON THE DISPLAY BOARD?

Words and pictures that tell about your invention.

- Your name and the name of your invention.
- What problem does it solve?
- How does it solve it?
- Who could use your invention?
- How does your invention make something easier to do?

## WHERE DO I GET A DISPLAY BOARD?

Ask your teacher or advisor. Check with an office supply store.

## HERE IS AN EXAMPLE OF A STUDENT INVENTION DISPLAY BOARD:

### The NO-SLIP SWIM GOGGLES

Inventor: Jeremy Reed

Materials:           The           problem:  
                          My            solution:  
                          Who           can use it:

Photos  
of  
swimmers  
wearing the  
NO-SLIP SWIM  
GOGGLES

# MINNESOTA STUDENT INVENTORS CONGRESS

## JUDGING CRITERIA

Inventions are judged on the basis of problem identification, research, originality and state of completion using the following criteria:

**1. The student identified a real need for the invention.**

The student needs to explain the problem the invention addresses and how it will make life better or easier.

**2. The student documented what similar inventions exist or existed.**

This question requires a student to research what exists or has existed to see if the invention is original. This may involve visiting appropriate stores, talking to adults, calling engineers, searching the Internet, etc.

**3. This solution appears to be better than previous or existing ones.**

The invention should be an improvement over what already exists if it is to improve the quality of life. (Quality of life doesn't necessarily mean practicality)

**4. The invention is original, either in the problem it addresses or in the solution.**

This is the most subjective question for judges. Has the student identified a unique problem that many of us would fail to recognize? Does the solution evidence thought processes and ways of perceiving that are unusual, yet result in a viable invention? Given everything you've looked at, does this invention stand out?

**5. There is sufficient evidence (in the model or research) the invention will work.**

Some students will invent something that is technically simple enough for them to build; others will have ideas that cannot be tested but can be researched. Either way, it is important that the student have enough follow-through to take the invention from idea to reality. There should be evidence that the student has this follow-through and that s/he will have something concrete to display.

## QUESTIONS THAT JUDGES MIGHT ASK:

1. How did you identify your problem?
2. What were some of your alternate solutions to the problem?
3. Was the invention/innovation difficult to make? What problems, if any, did you encounter?
4. How much do you think this invention would cost to buy?
5. How much did it cost you to make?
6. Why should I buy your invention?
7. Is there a similar invention that performs the same function? Why is your invention better?
8. How does your invention work?
9. What type of research did you do?
10. Did you test your invention to see if it works? How?
11. Did anyone help you with your inventions? (A "yes" answer is acceptable, provided that the adult assisted a young child with construction that might be dangerous. The child should know how the invention works and the processes needed for it to function.)
12. What improvements would you make to the invention?

## THINGS JUDGES WILL LOOK FOR:

Inventions are judged on the basis of problem identification, research, originality and state of completion using the following criteria:

### **1. Is there a log that documents the invention?**

The purpose of a log is to document work in progress and have it witnessed. Any ideas, experiments, findings, working drawings or calculations should be included. Spelling and penmanship are not judged.

### **2. Has the student identified a real need for the invention?**

The student needs to explain the problem the invention addresses and how it will make life better, easier, etc.

### **3. Has the student documented what similar inventions exist (or existed)?**

The student needs to research if similar inventions exist or have existed. This can involve visiting appropriate stores, talking to adults, calling engineers or other professionals, etc.

### **4. Does the solution appear to be better than previous or existing ones?**

The invention should be an improvement over what already exists if it is to improve the quality of life. (Note that quality does not necessarily or only mean practicality)

### **5. Is the invention original, either in the problem it addresses or the solution?**

The judges will look for inventions that perceive a problem in a new way, that identify a problem (and a solution) that most of us would fail to recognize, that discover unusual ways to develop a viable solution, or that generally stand out from the other inventions.

### **6. Is there sufficient evidence (in the model or research) that the invention will work?**

It is important that students have enough follow-through to take the invention from idea to reality, even though the invention may not be completely operational. Students should have something concrete to display or illustrate at the MSIC event.

MINNESOTA STUDENT INVENTORS CONGRESS  
**NORTHEAST REGIONAL EVENT**  
**JUDGING FORM**

**GRADE: (Circle One) 4-6 7-12 CATEGORY: \_\_\_\_\_**

**INVENTION NAME: \_\_\_\_\_**

**STUDENT NAME(S): \_\_\_\_\_**

**SCHOOL: \_\_\_\_\_**

**JUDGE'S NAME(S): \_\_\_\_\_**

	High							Low			
1. Student identified a need and solution for the invention	6	5.5	5	4.5	4	3.5	3	2.5	2	1.5	1
2. CREATIVITY (invention is distinctive, unusual or special)	12	11	10	9	8	7	6	5	4	3	2
3. INVENTION (well thought-out and thorough in detail)	6	5.5	5	4	3	2	1				
4. Sufficient evidence the invention will work	6	5.5	5	4	3	2	1				
5. LOG (appropriate documentation of the invention process)	6	5.5	5	4	3	2	1				
6. ORIGINALITY (idea is clearly original or a qualitative variation of another idea)	6	5.5	5	4	3	2	1				
7. EXHIBIT QUALITY (display board, artistry, design, appearance)					4	3	2	1			
8. VERBAL PRESENTATION (elaborates on ideas unique to the invention)					4	3	2	1			

**TOTAL SCORE: \_\_\_\_\_ / 50**

**IF YOU CAN ANSWER THESE QUESTIONS,  
THEN YOU KNOW MOST OF THE IMPORTANT RULES.**

1. Who can be part of the Inventor's Fair?

- a. \_\_\_\_\_ my grandpa
- b. \_\_\_\_\_ my cousin who lives in Iowa
- c. \_\_\_\_\_ only boys
- d. \_\_\_\_\_ only girls
- e. \_\_\_\_\_ any Minnesota kid from kindergarten to 12<sup>th</sup> grade

2. I am allowed to use my pet dog or cat in my invention.

True \_\_\_\_\_ False \_\_\_\_\_

3. If my invention is really **BIG** I better tell someone I need extra space.

True \_\_\_\_\_ False \_\_\_\_\_

4. I can work on my invention alone or with a friend.

True \_\_\_\_\_ False \_\_\_\_\_

5. If I have a swim meet or get sick on February 7 and can't come to the Inventor's Fair, I can ask someone else to show my invention.

True \_\_\_\_\_ False \_\_\_\_\_

6. My mom or dad or some adult they say is okay must come to the Inventor's Fair with me.

True \_\_\_\_\_ False \_\_\_\_\_

7. Not everyone who brings an invention to the Inventor's Fair in Duluth gets to take their invention to Redwood Falls.

True \_\_\_\_\_ False \_\_\_\_\_

8. If my invention needs electricity to work, what should I do?

- a. \_\_\_\_\_ bring a very long extension cord
- b. \_\_\_\_\_ tell someone before the Fair
- c. \_\_\_\_\_ I should do both a. and b.

9. When the Judges come to look at my invention, what should I do?

- a. \_\_\_\_\_ answer any questions they have
- b. \_\_\_\_\_ stand beside my invention
- d. \_\_\_\_\_ say quietly to myself "Judges are my friends"
- e. \_\_\_\_\_ I should do all of the above

**BONUS QUESTION:**

I don't think I know what these are yet, but I better keep a **log** and have a **display board**.

True \_\_\_\_\_ False \_\_\_\_\_



Each word does have more than one correct answer. Draw lines to all correct answers.  
(You may need to use the dictionary.) The answers are on the next page.

**MINNESOTA**

a person in kindergarten through 12<sup>th</sup> grade

people who make or introduce a new device

The Land of 10,000 Lakes

**STUDENT**

A group of people getting together to share ideas

means “walking together”

**INVENTORS**

the group of citizens elected to be government leaders

North Star state

**CONGRESS**

a person who is learning

St. Paul is its capitol

people who think up and make something brand new

in it is the town of Mountain Iron

## **MINNESOTA**

- The Land of 10,000 Lakes
- North Star state
- St. Paul is its capitol
- In it is the town of Mountain Iron
- Where you live

## **STUDENT**

- A person in kindergarten through 12<sup>th</sup> grade
- A person who is learning

## **INVENTORS**

- People who make or introduce a new device
- Someone who thinks up or makes something brand new

## **CONGRESS**

- A group of people getting together to share ideas
- Means “walking together”
- The group of citizens elected to be government leaders

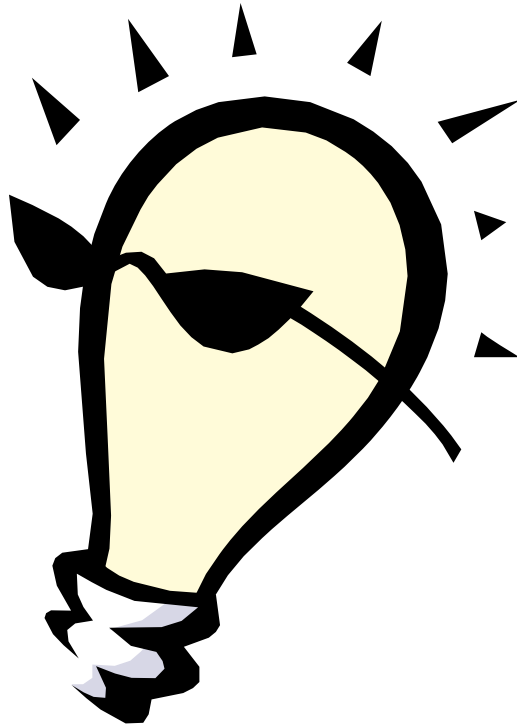
**WORK HARD!**

**HAVE FUN!**

**KEEP YOUR INVENTOR'S LOG UP-TO-DATE!**

**GOOD LUCK!**

**SEE YOU ON FEBRUARY 4<sup>th</sup>!**



## A PATENT PRIMER

On March 6, 1646, Joseph Jenkes received the first mechanical patent in North America. Issued by the General Court of Massachusetts, it protected his mill for manufacturing scythes. That was the prelude to the U.S. patent system which has helped give birth to major industries that have transformed the way we live.

On April 10, 1790, President George Washington signed the bill which laid the foundations of the modern American patent system. Since that time, the U.S. Patent and Trademark Office has recorded and protected the electric lamp of Thomas Edison, the telephone of Alexander Graham Bell, the flying machine of the Wright Brothers, and the inventions of hundreds of thousands of other inventors.

The patent system has protected inventors by giving them an opportunity to profit from their labors, and it has benefited society by systematically recording new inventions and releasing them to the public after the inventors' limited rights have expired.

A patent is a grant issued by the U.S. Government giving inventors the right to exclude all others from making, using, or selling their inventions within the United States, its territories, and possessions.

There are three kinds of patents: (1) *Utility patents*, granted to the inventor or discoverer of any new and useful process, machine, manufacture, composition of matter, or any new and useful improvement thereof; (2) *plant patents*, granted on any distinct and new variety of asexually reproduced plant; and (3) *design patents*, granted on any new, original, and ornamental design for an article of manufacture.

Utility and plant patents are effective for 17 years from the date issued, subject to the payment of maintenance fees; design patents are effective for 14 years. Patents may be extended only by special act of Congress, except for some pharmaceutical patents whose terms may be extended to make up for time lost due to Government-required testing.

Applications are assigned to examiners who are experts in various fields of technology. The invention must be new, useful, and unobvious to those in that particular field of study. This procedure normally takes about 18 months.

The U.S. Patent and Trademark Office is one of the most unusual branches of the U.S. Government. Its examining staff of over 1,600 is trained in all branches of science and examines thoroughly every application to determine whether a patent may be granted – a task, in these days, involving the most exhaustive research. Not only must the examiners search United States and foreign patents to learn if a similar patent has been issued, but they must study scientific books and publications to discover whether the idea has ever been described. Previous publication, invention or use prevents a patent being issued.

In addition to issuing patents, the Patent and Trademark Office has, since 1870, been in charge of registering trademarks, the business community's most valuable asset. More than 1,400,000 trademarks have been registered.

In its earlier days, the Patent and Trademark Office had on various occasions the responsibility for administering copyright matters, a task that since 1870 has been administered by the Library of Congress; collecting and publishing agricultural information and even collecting meteorological data. For some years, it was the custodian not only of the famous old Patent Office models – the delight of every visitor to Washington for many years – but of the Declaration of Independence, and other historical documents and relics.

By publishing and distributing copies of every U.S. patent, the Patent Office has made available to the public the world's greatest scientific and mechanical library.