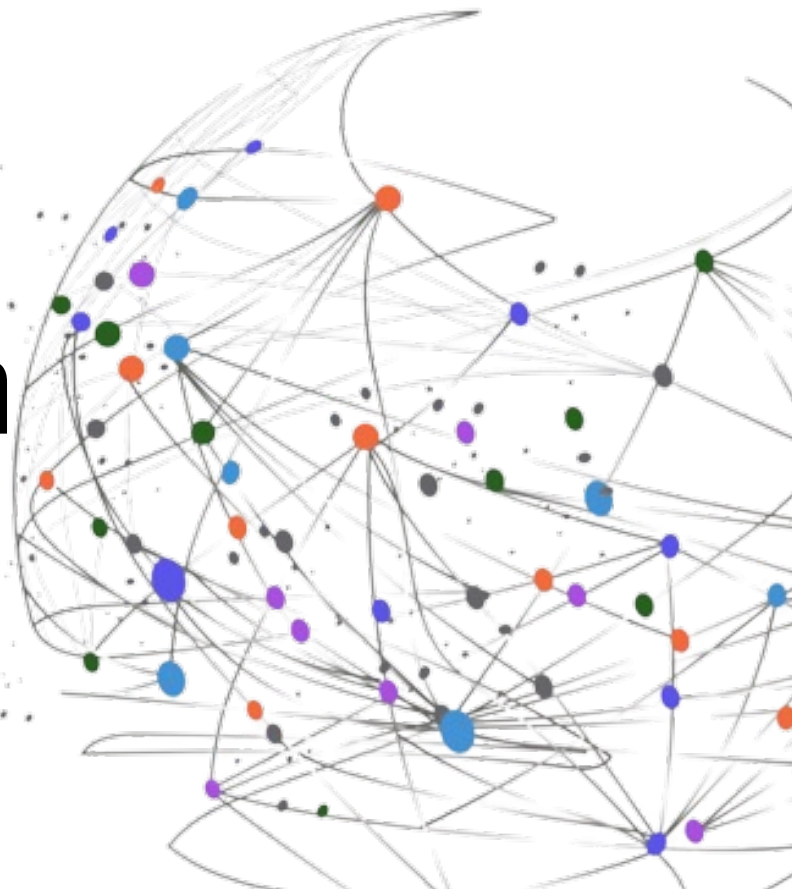


AI based Patent Classification

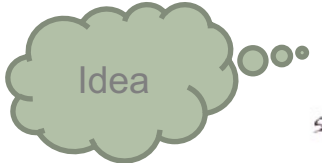
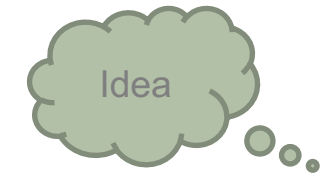
TD7 - KI Transformation

→ Chaitali Bagwe
Rakshit Bhat
Pranav Kulkarni
Mohandas Pai



Brainstorming

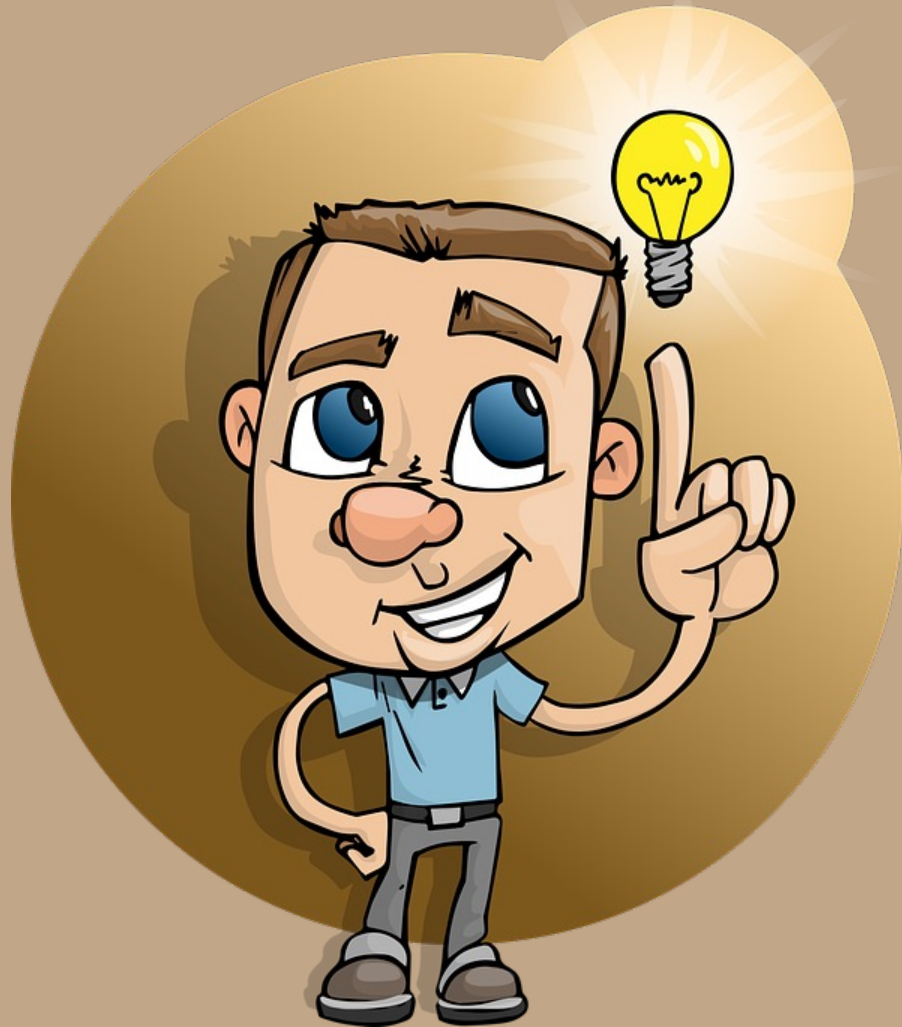




Handwritten mathematical formulas and diagrams, including:

- $\int x = \frac{1}{2} x^2 - c \left(\frac{1}{2} x^2 + c \right) = \frac{1}{2} x^2 - c^2 = x$
- $\left(\frac{a}{b} \right)^m = \frac{a^m}{b^m} \cdot \frac{1}{b^m} = \frac{a^m}{b^m} \cdot \frac{1}{b^m} = \frac{a^m}{b^m}$
- $F = \frac{ma}{\sqrt{1-\mu^2/c^2}} + \frac{m \cdot (u/c)^2}{(1-\mu^2/c^2)^{3/2}}$
- $\lim_{\Delta y \rightarrow 0} \frac{f(x_0 + \Delta y) - f(x_0)}{\Delta y} = f'(x_0)$
- $b^2 = a^2 - h^2$
- $AB = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$
- $x^2 + bx + c = 0$
- $h = \sqrt{a^2 - x^2}$
- $E = mc^2$
- $a^2 - b^2 = (a-b)(a+b)$
- $f(x) = a(x-x_1)(x-x_2)$
- $C(x) = a(x-x_1)(x-x_2)$
- $\frac{1}{b^m} = \frac{1}{b^m}$
- $b^2 + c^2 - bc \cos \alpha$
- $\frac{1}{\sqrt{2} \pi} \theta$
- $\sin \alpha + \sin \beta = 2 \sin \frac{\alpha + \beta}{2} \cos \frac{\alpha - \beta}{2}$
- $\log_c b = \frac{\log a}{\log c}$
- $\log_c a = \frac{\log a}{\log c}$
- $\sin \alpha = \frac{y_2 - y_1}{x_2 - x_1}$
- $\int_0^\infty \frac{\operatorname{erf}(\sqrt{x})}{e^x} dx = \frac{\sqrt{2}}{2}$
- $Q = mc \Delta t$
- $\sqrt{a/b} = \sqrt{a} \cdot \frac{1}{\sqrt{b}}$



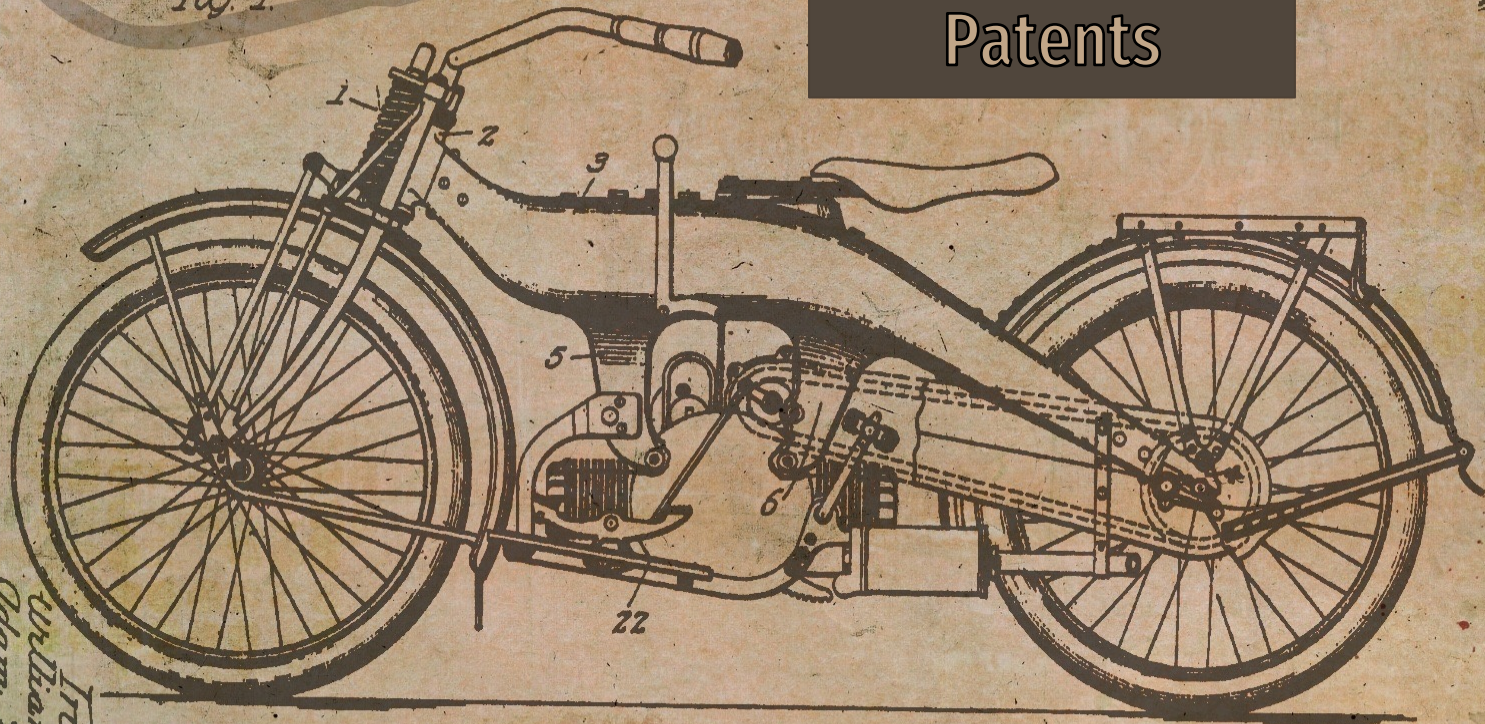


PATENT
PENDING

Fig. 1

Inventors:
William S. Harley
Adam Ziska Jr.
By Edwin R. H. Toward
Attorney

Patents



Oct. 7, 1924.

W. S. HARLEY ET AL.

MOTOR CYCLE

Original Filed Nov. 1, 1919.

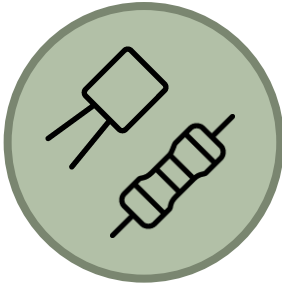
5 Sheet

Inventors:
William S. Harley
Adam Ziska Jr.
By Edwin R. H. Toward

4 Main Classes

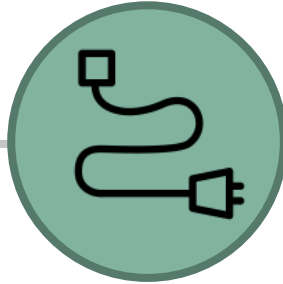
IPC – H (Electricity)

H01



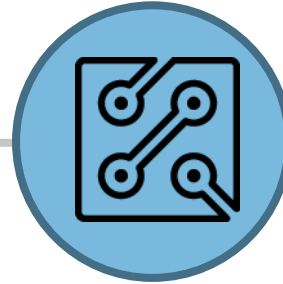
**BASIC
ELECTRIC
ELEMENTS**

H02



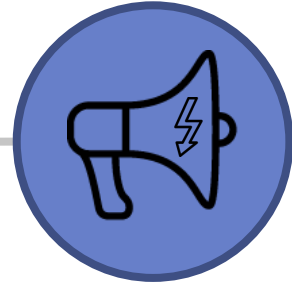
**GENERATION,
CONVERSION, OR
DISTRIBUTION OF
ELECTRIC POWER**

H03



**BASIC
ELECTRONIC
CIRCUITRY**

H04



**ELECTRIC
COMMUNICATION
TECHNIQUE**

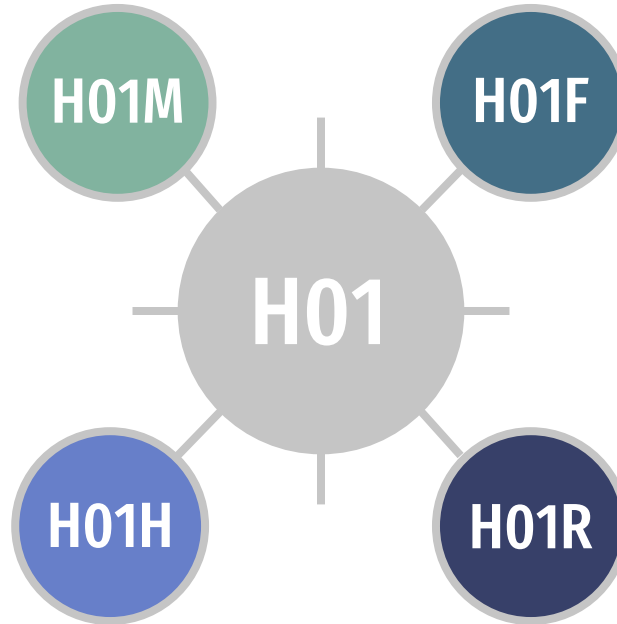
Then there are Sub Classes

H01M

Processes or Means

H01F

Magnets, Inductances,
Transformers



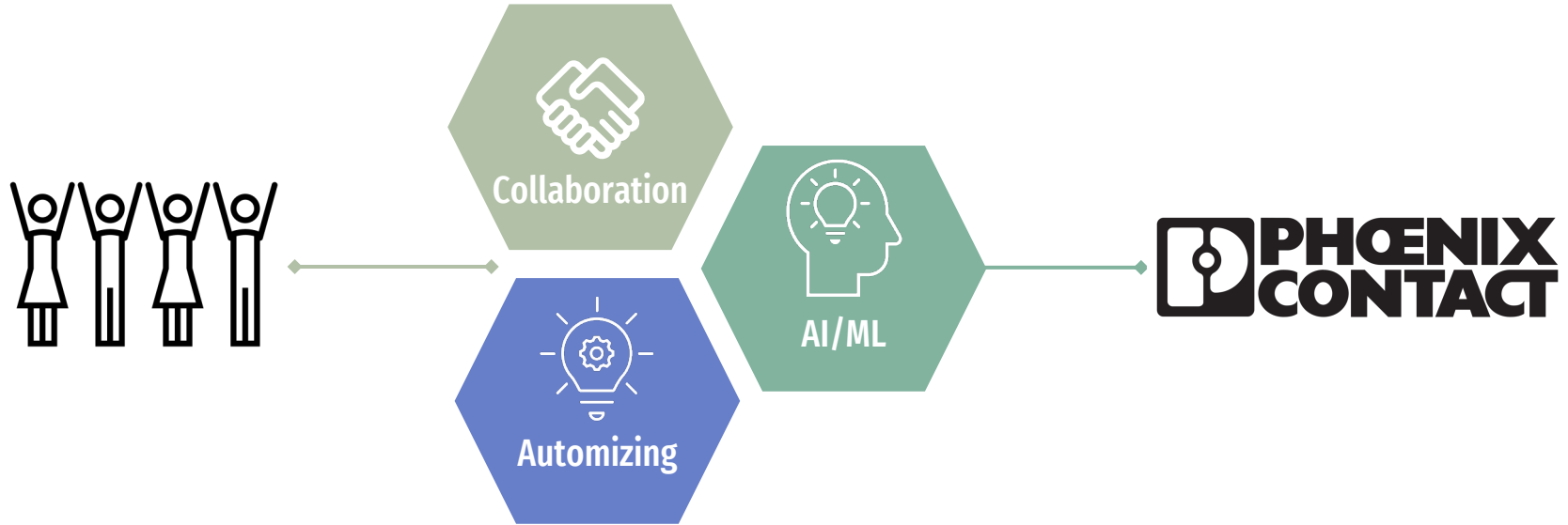
H01H

Electric switches,
Relays, Selectors,
Emergency protective
devices

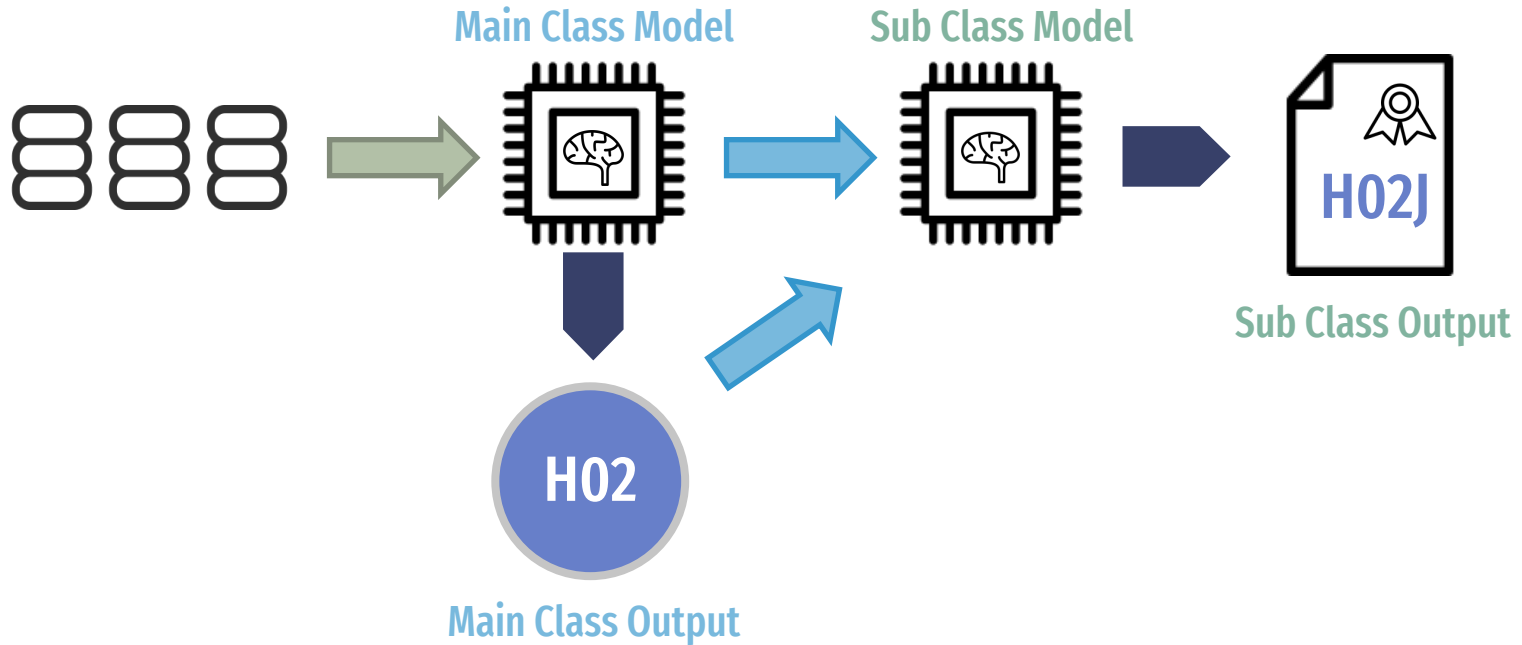
H01R

Electrically-conductive
connections, Coupling
devices

Collaboration



General Design



Main Class Metrics

Accuracy



83.25

F1-Score



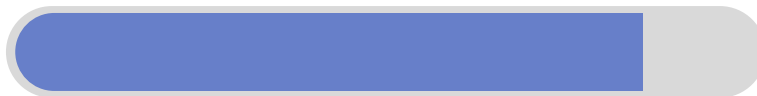
83.20

Precision



83.29

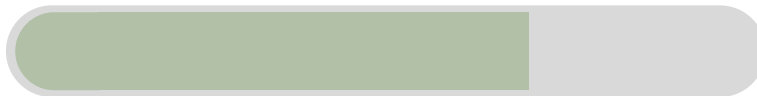
Recall



83.25

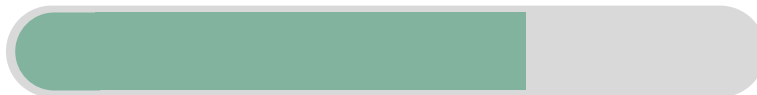
Sub Class Metrics

Accuracy



66.00

F1-Score



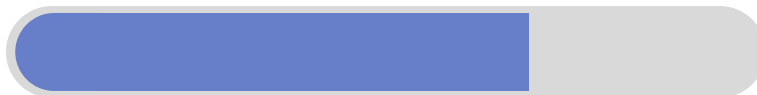
65.7

Precision



66.3

Recall



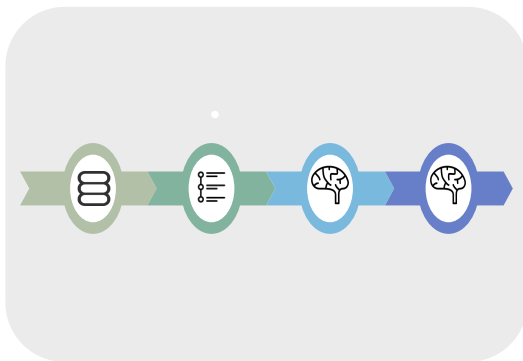
66.0

Features

F1 Score –
83.20 (M)
65.7 (S)

Runtime –
~ 20 mins

Extendable



Accuracy –
83.25 (M)
66.00 (S)

Focus on
Keywords

Light
Weight

Thank You

