

# Manual Coding Guidelines for Automation Patents

Katja Mann, Lukas Püttmann  
*University of Bonn*

7 March 2017

# Introduction

- This document lays out the guidelines for the manual coding of patent texts. “manual coding” means that a human auditor reads a patent text and decides what its content is and assigns a label to it.
- This document is used as both a reference and to train people.

# What is a patent?

- Patents guarantee the intellectual property right to an innovation. In the US this right is granted for 20 years.
- People or firms apply for patents in a *patent application* in which they describe, why a patent is new, useful and not trivial.
- The patent office then looks at the application and decides whether to grant the patent.
- If the patent is granted, an official *patent grant text* is written. This is the document we will look at.

# Patent grant text ...

... contains most importantly:

- title
- abstract
- detailed description

... and contains also:

- patent number
- name of the inventor
- date
- citations to other patents
- other legal information
- drawings
- technology classification number

## Our sample

- We study all U.S. patents 1976-2015.
- We only look at *utility patents* which are what we normally think of as patents. Other types of patents we exclude are design patents or plant patents.
- We randomly pick an equal number of patents from all years.
- Every patent is reviewed by an additional human auditor.
- The list of patents is given to the auditor in random (not chronological) order.
- Your classifications are anonymous and only saved with a coder ID.

## Our question to you

- Does the patent we will show you, *even just in a loose sense*, describe an automat?

# Definition

- An *automat* is a **device**<sup>1</sup> that carries out a **process**<sup>2</sup> **independently**<sup>3</sup>.
  - <sup>1</sup>: could be a physical machine, computer program, an algorithm, a robot.
  - <sup>2</sup>: could be a production process, the act of creation, composing a song, altering something, measuring something, a task
  - <sup>3</sup>: without human interference (apart from that needed for supervision, maintenance or at the start) and with a reasonable amount of completeness (so it should not be a minor part of a computer or machine even if that was what we think of as an automat).
- What we are not looking for:
  - tools, labor efficiency-enhancing machines
  - business or production methods and techniques
  - new chemicals or medical drugs
  - parts of machines (e.g. a tube) that does not automate or that is not a part of an automat
  - parts of computers or of software that does not directly contribute to automation
  - highly abstract algorithms (a potential application in automation should be recognizable)

# Tradeoffs

- Tool vs. automat
- Part of larger process vs. independent device
- Highly abstract vs. an application to automation is apparent



## Practical issues

- We will give you an Excel document containing a list of patent numbers such as: 7091471 or 7124853 or 9027105.

- Please go to one of the following websites:

<https://www.google.com/patents>

<http://patft.uspto.gov/netahtml/PTO/search-bool.html>

and enter the patent number

- Google Patents has the nicer interface so try using that first. If you cannot find it (this happens rarely) or if the patent grant text looks incomplete (also rare), please try at the USPTO search interface.
- An easy way to reach a patent is to adjust the following url by inserting the right patent number:  
<https://www.google.de/patents/US6121900>
- The right patent might not be the first one in the list. In Google Patents, you might find patents from other countries. You identify the right patent as the one starting with “US”. In the USPTO search interface, the right patent is often the last one in the list.

## Practical issues

- There are some warning signs, that you might have clicked on the wrong patent: if the main language is not in English (but for example in German or Chinese), then it's probably not an US patent.
- If the date of the patent grant text (also called publication date) is before 1976, then something might be wrong. We are only looking at patents that were granted in 1976 and the years after. The application dates can be earlier, though (sometimes long before 1976).
- If there is a problem and you cannot figure it out, please indicate that in the comment box.

# Manual coding

- After you have found the patent text, please read through the patent grant text, with a particular emphasis on the abstract and the description and decide: is this an automation patent?
- Please use 1 to encode a Yes and 0 to encode a No.
- There is also a comment field. Please try to avoid using this, but you can enter here if you had technical problems, if something seemed wrong to you or if you encountered some other problem.

# Sub-classification

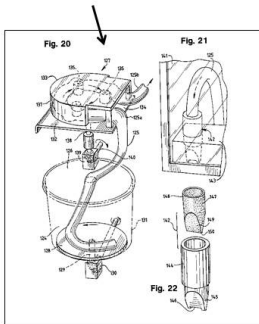
If Yes (the patent is an automation patent) please also decide:

- Is this is an analytical (automation) patent? We mean by that if it does something cognitive and non-physical. This would normally be software.
- Is this is a manual (automation) patent? So is it a physical machine? This could be a robot.
- It can also be both or neither.

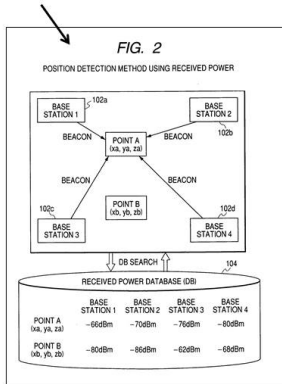
# Sub-classification

The drawings usually make this sub-classification easy. A cognitive or software patent usually has flow charts while a manual machine usually has drawings of a physical machine or a plan of electronic circuits.

Looks like a machine



Describes software



## The column “Highly uncertain”

- If you're highly doubtful if you made the right decision, please enter 1 into the column “Highly uncertain”. If you're sure, you don't need to enter a 0.
- Even if you're not sure and you write a 1 to “Highly uncertain” please still make the decisions on whether the patent is an automation patent and whether it is manual or cognitive.
- So far, we classified around 9% of patents that we manually coded as “Highly uncertain”.

## Excel table after filling it in

Pat. num.	Classification	Manual	Cognitive	Highly uncertain	Comment
8851703	0				
7725116					Technical problem
8975301	0				
4716621	1	1		1	
4789151	0				Not sure
4116621	1	1	1		
6785151	0				

Please note that these patents and numbers have not been checked so don't use them as an orientation for your coding. Also the proportion of patents classified as automation patents might not be representative.

# When you're done

- Please make sure your file is formatted the following way:  
`manclass_<FirstnameLastname>_<year>-<month>-<day>.xlsx`  
for example, for Lukas on the 11<sup>th</sup> of May 2015 that would be:  
`manclass_LukasPuettmann_2015-05-11.xlsx`
- and then send it back to us in an email to  
[katja.mann@uni-bonn.de](mailto:katja.mann@uni-bonn.de) or [lukas.puettmann@uni-bonn.de](mailto:lukas.puettmann@uni-bonn.de)



# Some empirical probabilities

So far, the different fields were marked with the following frequencies:

- Automation patent: 27%, of those:
  - manual: 42%
  - cognitive: 46%
  - both: 12%
  - neither: 0% (none so far)

## Some examples

The following slides contain examples of how we labelled some patents. You might find them useful to guide what you in your labelling. Click on the patent number to get to the website with the patent (internet access required).

## Example: automation patent (a clear case)

5531156: Automatic taco machine

- We classify this as an automation patent as it automates the process of cooking tacos, keeping them fresh and filling them with minimal human input or interaction.
- We classify this as not a cognitive, but as a manual automation patent.

## Example: automation patent (a clear case)

6362849: Color measuring method and device

- This patent contains a video camera, a processor and the program to measure color. We classify this as an automation patent as it independently recognizes colors.
- We classify this as both a cognitive and a manual automation patent.

## Example: automation patent (a clear case)

8857476 : Coinfusion apparatus

- This machine independently “mix[es] and adjust[s] medical agent such as anticancer drug”. This avoids the need for humans exposing themselves to dangerous materials. This means that “a part or the entirety of the coinfusion processing can be performed automatically by [the invention]”.
- We classify this as a manual machine.

## Example: automation patent (a borderline case)

8497785: Handheld electronic device and method for disambiguation of text input providing suppression of low probability artificial variants

- We classify as an automation patent, as it automates the process of recognizing complete words that are likely to occur from only a few letters that are entered.
- What makes this a boarderline case is that it is close to being a tool that is used interactively by people.
- As the patent contains both a small machine and the software to it with we classify this as both a cognitive and a manual automation patent

## Example: automation patent (a borderline case)

6905407: Gaming device having display with interacting multiple rotating members and indicator

- This is an automation patent as it automates the process of dealing hands for “including but not limited to the games of slot, poker, keno, blackjack, bunco and checkers”. What makes this a borderline case is the high degree of human interaction with the machine. Nevertheless, once the machine has been installed, it operates independently and with a high degree of sophistication.
- It contains both the physical machine (which also has moving parts) and the software (like programs to play games with) to run on it, so we classify it as both cognitive and manual.

## Example: **not** automation patent (a borderline case)

8457498: Methods and apparatus for target identification

- This patent is a system to differentiate enemy and friendly troops through a system of back and forth communication.
- We classify this as not an automation patent, but it's a close call. The process automates the identification of enemy targets. However, it does so in a large scale back and forth communication manner that more resembles a business operation process. This is not what we understand as an automat.



## Example: **not** automation patent (a borderline case)

5505821: Turbulence insert of a papermaking machine

- This is part of a machine which automates the process of paper making. However, it is only a small part of it related to the flow of materials.

## Example: **not** automation patent (a clear case)

5552597: Hand-held scanner having adjustable light path

- This is a small hand-held version of a larger desktop scanner which delivers an electronic version of printed text.

## Example: **not** automation patent (a clear case)

7878521: Bicycle frame with device cavity

- This is a bicycle frame that has a cavity for sensors. It does not automate anything.

## Example: **not** automation patent (a clear case)

4323683: Process for making pyridinethione salts

- This is a manufacturing method to make salts used against dandruff. It is for various reasons not an automation patent: it is not a device (but a production method), it is not clear if a machine or a human will produce it

## Example: **not** automation patent (a clear case)

4656917: Musical instrument support

- This patent by the guitarist Van Halen describes a device that allows for more creative guitar handling and playing. It does not automate anything, but rather enables a person to do something she could not previously do.

## Some FAQs

The following slides contain the Frequently Asked Questions (FAQs).

# FAQs

- *What am I looking for?*

We ask you to classify patents as to whether they are about automation or not. If they are about automation, we also ask you whether they are cognitive or manual.

# FAQs

- *What should I write to say Yes?*

Please write 1.

- *What should I write to say No?*

Please write 0.

- *Can I also leave the field blank if it's a No?*

We ask you to please fill out the classification with either a 0 or a 1. The 0 is important for us to see that you made a conscious decision about it. If that's somehow not possible, leave it empty and please write this into the comment box. The fields cognitive and manual you can leave empty to signal a No.



# FAQs

- *What if I cannot find the patent?*

Sometimes patents don't show up in Google Patents, but they do appear in the USPTO search interface. In Google Patents you might get several hits and you should search for the patent number starting with US and then the number we give you. On the USPTO website, the patent you're looking for usually shows up as the last hit. If after some searching you cannot find it, please just write something like "Cannot find" in the comment box.

# FAQs

- *Can I enter something else like “1?” if I’m not quite sure?*

No, please write a “1” into the field “Highly uncertain” if you’re not sure.

# FAQs

- *Should I read the whole patent?*

No, that is likely not necessary (if the text is not very short). We recommend to concentrate on: the title, the abstract (which is a short overview) and the description. The beginning of the description is often most interesting and there is sometimes a section called “background” which is informative. It also helps to look at the images. It can also help to see which patents were cited (they are likely similar to the one you’re looking at) and who applied for it (you might know the firm and infer something from that). You can also use outside knowledge (like Googling a term).

# FAQs

- *Should I enter whether a patent is cognitive or manual even if I don't think the patent is an automation patent?*

No, that is not necessary, you can just leave the field empty if the patent is not an automation patent.

# FAQs

- *Do I need any technical knowledge to judge a patent?*

Patent texts are written in a technical language and they can be very complex. We only ask you to classify the patent as an automation patent if you are *reasonably sure* that the patent is an automation patent. If you absolutely cannot figure it out, then mark “Highly uncertain” or consider writing that in the comment box.

# FAQs

- *How often do you expect me to use the comment box?*  
Please only use that box to mark if you encounter any problems, if something is unusual or you think there is another reason to tell us about it.

# FAQs

- *What if I don't understand what the patent is about?*

No problem, just judge if you think this patent might have something to contribute to automation. If you're not at least reasonably sure, please use the filed "Highly uncertain".

# FAQs

- *How long should I take for a patent?*

There is no clear number here. If it's less 30 seconds on average per patent, it's probably too fast. If it's more than 5 minutes per patent on average, it's probably too slow. But the speed will likely differ between people. It's often much faster to see that a patent has *nothing* to do with automation, rather than deciding it is an automation patent. It's recommended by us to take more time for patents that you think might be automation patents.



# FAQs

- *Am I doing you a favor if I classify more patents as Yes?*

Unfortunately not. We might use your classifications to classify more patents. This will not work if patents are wrongly classified. Also, it makes our work more credible if the manual classifications have a high quality.

# FAQs

- *Should I hurry and try to classify as many patents as possible?*

No, please take your time. It's much more important for us for your coding to be accurate than to code more patents. Don't worry if things are going slow, it's ok to classify only a few patents. If you're tired and you think you might be making mistakes, then please take a break or stop.

# FAQs

- *What the are computer requirements?*

You need use to a computer with access to the internet. We would also prefer if you used Microsoft Excel to fill out the sheet. If you need to use some other spreadsheet software, please let us know and we will send you a differently formatted file.

# Conclusion

- That is it. We hope you are well equipped to identify automation patents now.
- If any questions remain, please do not hesitate to talk to us or write to us at to [katja.mann@uni-bonn.de](mailto:katja.mann@uni-bonn.de) or [lukas.puettmann@uni-bonn.de](mailto:lukas.puettmann@uni-bonn.de)
- And last: Thank you very much! You are helping us with our research and we are very grateful that you are investing some of your time for that.