

## USING ARTIFICIAL INTELLIGENCE FOR DRAWING A PATENT APPLICATION IN THE MECHANICAL FIELD

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**Abstract:** Artificial intelligence programs are currently used to solve a very wide range of problems in different fields of human society. On the other hand, there are concerns regarding the involvement of these programs in the development of so-called patent applications. In the paper, the problem of developing the description of the invention, the claims, and the abstract corresponding to a very simple object, namely a tea cup, was addressed. This cup had to be provided with means to notify the user about the temperature of the liquid inside it. It was found that the ChatGPT program was able to develop the requested documents at least in part in an accessible form. However, there were also aspects that would require the intervention of the inventor to ensure the consistency of the contents of the documents with the regulations formulated in this regard by the authorities with responsibilities in the field of patenting activities.

**Keywords:** ChatGPT, patent description, claims, abstract, tea cup.

### 1. Introduction

The concept of *artificial intelligence* refers to computer systems or programs capable of imitating human thinking, accumulating knowledge, reasoning, planning, and materializing specific actions to achieve certain objectives [Ce, 2025]. Generative artificial intelligence is a branch of artificial intelligence that not only analyzes available information, but also creates new content, in a relatively short time frame [O scurtă, 2024].

Currently, an invention is considered patentable if it is new, if it results from an inventive activity, and if it is susceptible to industrial application. A patent is a document issued by the competent authorities which confirms the ownership right of a person over

a solution to a technical problem. At the same time, the document confirms that, with a high probability, the author of the invention is the first person to identify a solution to the technical problem addressed.

Obtaining a patent requires the preparation and submission to the competent authorities of documents that constitute the so-called *patent application*.

The number of patents and patent applications filed annually in a country is important because it provides information on the extent to which the country stimulates the interest of its citizens to carry out and efficiently use innovative activities. In general, in economically advanced countries, compared to less developed countries, there are high

values of the ratio between the number of patent applications or inventions and the number of inhabitants of the country in question [Slătineanu, 2002; Slătineanu, 2020].

Although the preparation of a patent application is not always a simple and easy activity to perform, researchers from various fields have expressed concerns about using artificial intelligence to prepare some of the documents specific to a patent application.

Thus, Dornis believed that artificial intelligence and innovation may constitute an end to the patent law as it is known in the U.S.A. [Dornis, 2020]. He believes that patent law should be amended to keep the patent system operational.

Villasenor has estimated that artificial intelligence will contribute to the development of the patent application at much lower costs than today [Villasenor, 2020].

Aloun has considered that the section of a patent application that must present the prior art in the field of the invention could be better performed by artificial intelligence [Aloun, 2024].

Hau and Minh have compared the possibilities of protecting inventions conceived by artificial intelligence in accordance with the legal provisions of the United Kingdom of Great Britain and Northern Ireland and Vietnam, respectively [Hau, 2025]. It is found that the legislation does not take into account, for now, the situation that the inventor is not a human being.

Research efforts are still being invested in the development of software capable of using artificial intelligence to describe the state of the art, analyze patentability, and draft the initial patent specifications [Patenty, 2025; Sangmin, 2025].

The content of this paper intends to present the results of research that aimed at the possibility of using the ChatGPT artificial intelligence program to generate some of the components of the documentation corresponding to a patent application. A simple object of the proposed invention was chosen, so that it could be defined in a few sentences and could be easily understood by ChatGPT.

An analysis of the answers provided by ChatGPT was carried out in order to identify those aspects where the intervention of the author of an invention proposal is still necessary.

The attempt to analyze the results of using the ChatGPT program aimed, among other things, at identifying solutions for involving the program in the process of familiarizing students with the stages that must be followed when it is necessary to formulate a patent application.

## 2. Artificial intelligence and its uses

The development of artificial intelligence was made possible by generating algorithms and models that allowed computer programs to largely take over the tasks that humans must perform. This development of artificial intelligence was possible when certain levels of development of computer science knowledge and, on the other hand, sufficiently powerful computing systems were reached. The problems that can be solved with the help of artificial intelligence belong to a very wide range, from simply obtaining information about a certain subject to undertaking extensive and complex actions, such as the design and coordination of productive activities and military actions [O scurtă, 2024].

The use of artificial intelligence has primarily contributed to eliminating the need for human operators to perform repetitive or difficult activities, but it can also be used effectively in the design and engineering of systems and processes. Although it is currently considered that artificial intelligence can generate truly innovative solutions somewhat more difficult (artificial intelligence being based, essentially, on the information available, therefore existing on the internet), it is quite likely that in a relatively short period of time, it will be able to approach and solve more complex problems involving a high level of creativity. At the same time, there is the danger that artificial intelligence will also be used to achieve objectives that may conflict with the requirements of human civilization.

**Table 1:** *Content of the request made to ChatGPT to generate a patent application*

Content of the request [ChatGPT, 2025]	Comments of the authors of the paper
Please prepare an invention proposal (patent application) for a cup equipped with a thermometer, to see the temperature of the liquid in the cup and avoid burns caused by a liquid that is too hot.	The aim was to keep the subject matter of the patent application simple and the application as clear as possible.

For this reason, in the concerns of researchers and designers of systems and processes, there must be special caution in promoting the various aspects of human intelligence.

### 3. Preparing a patent application without using artificial intelligence

The technical documentation corresponding to a patent application includes, in principle, a description of the invention, the claims, the explanatory drawings, and the summary of the invention [Information, 2025].

Once the inventor has a clear idea of the subject matter of the invention, he can proceed to the elaboration of the description of the invention. The main components of a description of the invention [Judgment, 2008] are: the title of the invention, the specification of the technical field to which the invention relates, the presentation of the state of the art, the presentation of the technical problem, the exposition of the invention, the presentation of the advantages of the invention, the presentation of the figures in the drawings, the detailed presentation of at least one way of carrying out the invention.

An important document of the patent application is the *claims section*. In principle, an operational elaboration of the description of the invention and the claims may require both technical knowledge and knowledge regarding the requirements regarding the structures of the description of the invention and the claims, and sometimes even certain legal knowledge. The development of two of the aforementioned components (the description of the invention and the claims section) is not always an easy problem to solve, and, for this reason, patent advisors are sometimes called upon, i.e., specialists with extensive knowledge of the development and submission of patent

applications to the competent authorities. On the other hand, the attention of researchers and inventors has also been directed towards identifying possibilities for using artificial intelligence to take over at least partially the tasks of developing these components. Given the wider use of the ChatGPT artificial intelligence program, the possibility of using this program to develop some of the components of a patent application was considered in this paper.

### 4. Formulating the request to ChatGPT

To prepare the request for the preparation of a patent application to ChatGPT, it is necessary to ensure a sufficiently clear formulation regarding the subject matter of the patent application. For this reason, ChatGPT's approach was preferred in the case of a relatively simple object whose elements of novelty susceptible to patenting can be expressed in as few and clear sentences as possible. In this regard, an object of the patent application was chosen such as a cup which, in order to avoid affecting the user's health when he intends to drink a hot liquid in the cup, allows the temperature of the liquid inside it to be displayed on the cup. The actual form of the request addressed to ChatGPT is that in Table 1. The conversation with ChatGPT took place entirely in Romanian. The fonts used by the program were largely preserved, although sometimes these fonts are not exactly the recommended ones.

### 5. Results and considerations regarding the use of ChatGPT for filing a patent application

As can be seen from the analysis of the findings included in Tables 2 and 3, ChatGPT

**Table 2:** *Description of the invention provided by ChatGPT*

Sections proposed by ChatGPT for the description of invention [ChatGPT, 2025]	Comments of the authors of the paper
<b>Title</b> <b>Cup with integrated thermometer for monitoring liquid temperature</b>	The proposed title does not appear to meet the requirements of clarity and conciseness, and non-disclosure of the invention.
<b>Technical field</b> The present invention relates to the field of household items, in particular to containers for hot drinks, and more specifically to a cup equipped with means for measuring the temperature of the liquid contained, for preventing burns caused by premature consumption.	The technical field is too detailed, including aspects of the proposed solution.
<b>State of the art</b> Currently, there are containers for hot drinks (cups, thermoses, etc.) that sometimes include external sensors or smart lids. However, these solutions are either expensive or integrated into complex electronic devices, making them difficult to use in the case of simple cups for everyday use. There is no standard cup on the market equipped with a <b>simple and readable thermometer</b> that directly indicates the temperature of the liquid before consumption.	The documents/sources used to develop the section were not indicated.
<b>Technical issue</b> The aim is to avoid oral burns caused by accidental consumption of liquids at high temperatures (>60–65°C).	The wording is not exactly the one recommended by the competent authorities in Romania.
<b>Proposed technical solution</b> The invention consists of a cup made of ceramic, temperature-resistant glass or other suitable material, provided with: <ol style="list-style-type: none"> <li><b>1. A thermometer integrated</b> into the wall of the cup or in the handle. <ul style="list-style-type: none"> <li>- The thermometer can be: <ul style="list-style-type: none"> <li>- analog (with thermometric liquid or thermochromic strip) or</li> <li>- <b>digital (with electronic thermal sensor and LCD or LED display).</b></li> </ul> </li> </ul> </li> <li><b>2. Ergonomic positioning of the display</b> so that the user can view the temperature of the liquid in real time without tilting the cup.</li> <li><b>3. Optional, visual warning system:</b> <ul style="list-style-type: none"> <li>- color change (e.g., thermochromic strip that turns red if the liquid exceeds 60°C);</li> <li>- light signal on the digital display.</li> </ul> </li> </ol>	The wording can be improved to correspond to the methods recommended by Romanian regulations. It is worth highlighting the proposal of several interesting solutions to solve the technical problem.
<b>Description of the invention</b> The cup, according to the invention, is composed of a container body with a standard volume (100–300 ml), equipped with a temperature measurement assembly. In a preferred embodiment, the digital thermometer is placed in the handle, and its temperature sensor is in direct contact with the inner part of the cup wall. <ul style="list-style-type: none"> <li>- <b>Variant 1 (analog):</b> a thermochromic strip glued to the outside, in the lower area, which indicates the temperature ranges by changing color (e.g., &lt;40°C blue, 40–60°C green, &gt;60°C red).</li> <li>- <b>Variant 2 (digital):</b> electronic sensor integrated in the lower wall, connected to a small LCD screen on the handle. The display shows the exact temperature in degrees Celsius or Fahrenheit.</li> <li>- This configuration ensures a <b>fast and safe reading</b> of the liquid temperature, preventing burns and optimizing the consumer experience.</li> </ul>	The sections provided for in the regulations and relating to the presentation of the advantages of the invention and the brief presentation of the explanatory figures were not addressed. It is worth noting the consideration of two variants of the materialization of the invention.

managed to develop the description of the invention, the claims and the abstract for an object such as a cup that must notify the user about the temperature of the liquid inside the

cup, so that he does not suffer negative effects due to a too high temperature of the beverage.

It can be seen that ChatGPT understood the subject very well, and that it respected in principle the requirements for formulating a

**Table 3:** Brief observations on the contents of the claims sections and respective summary proposed by ChatGPT

Claim sections and abstract proposed by ChatGPT for the patent application [ChatGPT, 2025]	Comments of the authors of the paper
<b>Rehealings (Claims)</b> <b>1. A cup for hot liquids</b> , characterized in that it includes an integrated thermometer for displaying the temperature of the liquid contained. 2. The cup according to claim 1, wherein the thermometer is of <b>the thermochromic analog type</b> fixed to the outer wall. 3. The cup according to claim 1, wherein the thermometer is of <b>the digital type with an electronic sensor</b> and an LCD/LED display located on the handle. 4. The cup according to the preceding claims, wherein the thermometer is provided with visual warning means for temperatures considered dangerous for consumption	A first remark was that of a misspelling of the title of the claims section. ChatGPT used a name with a pronunciation close to that of the concept of claims, but having, in Romanian, a meaning much different from the desired one (cures after a disease). It is noted that, from the point of view of form, the expression that separates the known from the novel part of a claim (" <i>characterized by the fact that</i> ") was not always or correctly used. There are also some overlaps in content between the four claims. No symbols of the parts or subassemblies included in the structure of the invention were included.
<b>Abstract</b> The invention relates to <b>a cup with an integrated thermometer</b> that allows direct monitoring of the temperature of the liquid contained, preventing burns caused by premature consumption of hot drinks. The thermometer can be analog or digital and is located to be visible to the user at all times	In principle, the summary seems acceptable from the point of view of its structure.

patent application in accordance with Romanian regulations.

Let us note that the request was not for the design of a complicated solution, but only for an object whose possible elements of novelty could be described in a few words. It is possible that, in the case of more complex objects, mistakes or more extensive expressions made by the program would be less acceptable.

It can also be noted that, as is currently known, ChatGPT formulates answers based on consulting information available on the Internet and previously stored in databases accessed by the program.

It is therefore possible that in the case of complex inventions, the program may be confronted with problems for which it may not find the most convenient solution. For such reasons, it is strictly necessary, for the time being, for the intervention of the inventor to correct any errors and to better fulfill the conditions formulated in the regulations regarding the preparation of patent applications.

An ethical issue involved in the use of ChatGPT may be the designation of the authors of the invention proposal. The involvement of ChatGPT may lead to the

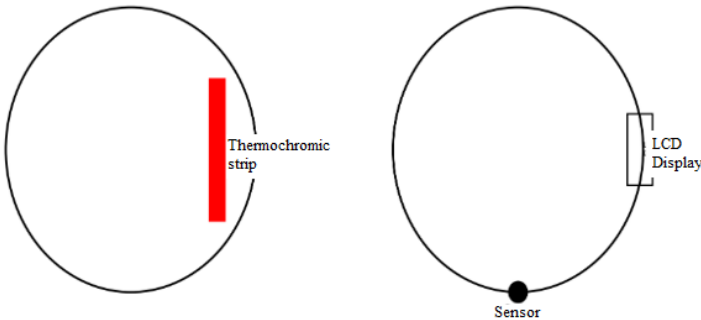
question of whether the program should be registered as a co-author of the patent application. From this point of view, the answer is relatively simple and was formulated by ChatGPT itself to a question formulated in this regard. The program's answer, which is in accordance with the currently valid legislation, confirms that ChatGPT will not appear as a co-author; it only contributes to the transposition of the idea formulated by the patent application subject in a format recommended by the competent authorities. However, it is necessary to highlight the existence of some solutions that seem to present elements of novelty.

At the end of the text containing ChatGPT's response to the user's request, the program asked a question related to the possibility of the program developing drawings (figures) that normally must be submitted together with the description of the invention. The question formulated by ChatGPT, the program user's response, and the authors' comments on these aspects can be seen in Table 4.

## 6. Conclusions

The expansion of the use of artificial intelligence and the involvement of researchers in analyzing the possibilities of

**Table 4:** Continuing the conversation with ChatGPT regarding the possibility of generating sketches

Elements for continuing the conversation with ChatGPT [ChatGPT, 2025]	Comments of the authors of the paper
Do you want me to also draft schematic drawings (in a technical, simplified style) to accompany your patent application, with both analog and digital versions? These are almost always required upon actual filing.	Initially, ChatGPT was not requested to develop drawings, so the question posed by the program was answered positively.
<p>The result obtained after formulating an acceptance response</p> <p>Cup with analog thermometer (thermochromic strip)    Cup with digital thermometer (sensor + display)</p>  <p>Here are two simplified technical drawings for your invention:</p> <ul style="list-style-type: none"> <li>● <b>Left:</b> cup with an <b>analog thermochromic strip</b> applied to the back wall.</li> <li>● <b>Right:</b> cup with <b>digital thermometer</b>, sensor on the bottom of the cup and LCD display in the handle.</li> </ul> <p>Would you like me to prepare these drawings for you in a form suitable for attaching to a patent application (PF'DOCX)?</p>	The drawings prepared by ChatGPT are relatively simple and, as such, less clear or complete. However, the information entered in text form by ChatGPT immediately below the figures can be appreciated as interesting. The recommendation that each figure should have a separate number was not followed. No symbols of the parts or subassemblies existing in the composition of the invention were included.

using artificial intelligence for the development of patent applications led to a question regarding the analysis of how some of the components of a patent application can be developed in Romanian by the ChatGPT program. To this end, a request was made to prepare some components specific to a patent application in the case of a relatively simple object, namely, in the case of a cup that would inform its user about the temperature of the liquid in the cup. It was found that, although not all the problems specific to a patent application were solved rigorously and correctly, ChatGPT proved to be able to design a structure that, of course, still requires some corrections, but which can be considered a valuable help for those who want to develop some of the documents corresponding to a patent application. In the future, it is planned to investigate the possibilities of using other artificial intelligence programs, in order to be able to compare them from the point of view

of the correctness and efficiency of the solutions proposed by such programs.

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