

## A STEP TOWARD PATTERNING A PATENT HEADING (with special reference to US semiconductor patents)



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Our task in the present paper is to establish the most widely spread syntagmatic patterns for the specifically important part of a patent, in other words what we need is to make up a certain cognitive chart for patent headings. The choice is motivated by the fact that scientists all over the world make use of special catalogues of headings at the initial stage of patent search. From a very big mass of patents they have to select those which they want to study. Catalogues of headings are a great help here. The skeleton of any scientific piece of writing can be presented through syntagmatic patterns peculiar to that specific genre. Patterns provide the reader with cognitive, adequately elaborated standard situations. Patterns obtain new life in the readers' memory when used in the environment of other words. Sentences become a kind of flesh and blood for patterns.

Communication is successful only when both the addresser and the addressee have the necessary scientific knowledge. The case is complicated when people involved in the act of communication act are carriers of different culture, mentality and speak different languages.

Establishing patterns for patent headings will help the scientist to understand the text more easily since scientific knowledge is expressed through language means and has a great impact on the creation and understanding of the discourse. Cohesion and coherence, Combinability and interdependence of language units in discourse are the most prominent aspects in understanding any text. The role of syntagmatic relations and hence, syntagmatic patterns is rather significant in this respect.

We have made an attempt to establish certain generalized types of most common headings of patents dealing with semiconductors issued in the USA. Efforts have been made to classify American patent headings according to form and content. It should be noted that the syntactic bond found in these structures is the attributive one.

Our observations show that the most common types of patent headings are those which contain syntagms introduced by *with* or *without*; *for* or *for use/using in*; *including/ having/comprising*. Still one more group is found to be rather common, and

that is when up to five attributes are used to define the same object. The mentioned phenomenon, called *condensation*, helps to give a multi-lateral description of the object under consideration, like *Integrable Large Dynamic Range Photodetector Element for Linear and Area Integrated Circuit Imaging Arrays*.

The detailed study of the matter led us to the assumption that these similar ways of compiling a patent heading allow to establish patterns, which is possible due to the unity of form and content. As for instance, if the specific area of the novelty is mentioned, the part is introduced by means of *with*. If the specific field of application or the purpose is indicated, the *for* - pattern is used.

When inventors speak about the essence of the method/device to be patented or the ways of obtaining a particular substance they use the pattern *method /device + of / for + smth/doing smth + [ by smth else]...* The following examples illustrate this pattern:

1. *Method of making*
2. *Method for manufacturing a MOS transistor having reduced 1/f noise*
3. *Device for the activation of an apparatus for measuring acoustic emission by detection of background noise.*

All the three examples show that the object of invention is a whole, not an element. Moreover it is quite obvious that in Eg.1. the *comma* and then *and* state the fact that the patent is issued for three objects closely interconnected. If authors want to specify how the desirable effect or object is obtained the pattern containing *by* is introduced (Eg. 3). In this very example the use of the first *for* indicates the general purpose of the device and the second *for* is used to show why the activation is so much desirable. Hence, *measuring acoustic emission by detection of background noise* only becomes possible due to the introduction of this specific device. So, the novelty of invention should be found after the first *for*, the second *for* is used to introduce important details. In Eg.2 the pattern beginning with the participial form *having* bears the logical stress, in other words, this is the part of the heading on which the reader's attention should be focused because the novelty of invention is hidden/revealed here. The following examples come to prove that in many headings the word *with* is used in the meaning of *having*:

4. Semiconductor radiation detector *with* downconversion element
5. Extrinsic Infrared Detector *with* Dopant Site Charge Neutralization

Still there are cases when authors use the participial forms *Including* and *Comprising*. Eg. 6 and 7 provide good illustration of what has been said.

6. Method of making a low noise semiconductor device *comprising* a screening measurement.
7. Avalanche photodetector *including* means for separating electrons and holes.

Yet, there are cases when the desirable effect is obtained by means of removing of some rather undesirable effects. To introduce this the word *without* is used, and the whole pattern bears the logical stress, like it is in the example below.

8. Reduced 1/f noise in NPN transistors *without* degrading the properties of Pnp transistors in integrated circuit technologies.

Sometimes authors mention the specific field of application. They mean to emphasize the fact that the use of the device in the field introduces radical changes and there they can talk about a new invention, as one can in the example below.

9. Complex band-pass. DELTA.SIGMA. AD modulator *for use in* AD converter circuit

From the heading it is obvious that the use of the mentioned modulator carries out a special task in AD converter circuit, its performance must be rather satisfactory, and the desirable effect must have been obtained. We call these stressed syntagms AAEP- attention activation elements of a patent .

Syntagms introduced by means of Participle II in the function of an attribute have the aim to inform the addressee about the feature or place where to look for the novel feature of the invention.

10. *Graded* Bandgap Multilayer Avalanche Photodetector with Energy Step Backs.

11. *Sensitized* Epitaxial Infrared Detector

In Eg.10 energy step backs are expected to be found in photodetectors which are graded, while in Eg.11 the novel feature is closely connected with the quality of sensitization of the detector, it means that the desirable effect is obtained by radically changing the level of sensitization.

Headings, which simply have the form *attribute/s +noun*, do not give a detailed description of the device. The point is that when the author compiles the heading using general words and not specific ones, he intends to widen the sphere of his exceptional rights – right of authorship.

In the following examples /Eg. 12, 13, 14, 15, 16, 17/ the authors have only mentioned the general field of the invention. A bit more details that make the objects of the mentioned inventions distinguished as compared to the ones that previously existed, are discussed in the abstracts which can be found on the same page together with the headings.

12. Majority Carrier Photodetector.

13. Multiple - Quantum - Layer Photodetector.

14. Focal plane array infrared device.

15. Magnetic susceptibility imaging (MSI).

16. Sensing phage-triggered ion cascade (SEPTIC).

17. Double HBT base metal micro-bridge.

The copulative conjunction *and* can be used to show that one and the same patent includes two or more objects of invention closely connected with each other (the whole and its part, the method and the device whose work is based on that particular method, etc.):

18. Bipolar transistor and method for producing same

The extralinguistic reality is that one patent can have two objects of invention if one of them comes to greatly influence the productivity of the device (element and the device), that is its introduction brings about a/the desirable change. Since the heading should include all the important points which are going to be considered in the text of the patent, the selection of syntagms is carefully made.

There is an opinion that the heading of certain types of texts – those of belonging to the sphere of factive writing - represent the rheme. It is based on the assumption that the heading of a scientific article reveals the essence of that piece of writing while titles of fiction stories generally do not. In fact, linguistic means in a patent heading are to provide two types of information - scientific and patent. As we have shown in our previous publications, the style of patent specifications should be dealt with as a specific genre having an intermediate position between the scientific prose style and that of official documents. The basic requirement towards a patent heading is that it should clearly inform the reader what the paper is going to discuss in general and where the novelty should be looked for. Since the heading deals with the novelty of invention it should necessarily contain a rhematic component. So, the whole heading can be treated as a rheme. As we have already mentioned, the rheme should be placed in the syntagm which begins with the stressed word, that is the word which bears the logical stress introduces the rheme. What is not included in the patent heading is the know-how. It has a special price and it is even more expensive than the object of invention itself.

As patents present two domains of style - scientific and official, their headings can be patterned more easily because officialese is observed not only on the level of vocabulary but also, to a greater extent, on the level of morphological structures. This aspect has been the main focus for the classification presented within the scope of this article.

In the course of our investigation the following universal pattern [ *method /device + of + Including/ having/comprising. + for + +smth/doing smth + [by smth else]+ for use/using in* ] has been established for the US patent headings registered in the field of semiconductors.

#### References:

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### **Արտոնագրային վերնագրի կաղապարման հարցի շուրջ (կիսահաղոդչային ոլորտի ամերիկյան արտոնագրերի նյութի հիման վրա)**

Սույն հոդվածում փորձ է արվում սահմանելու այն հնարավոր կառուցվածքային-կաղապարային տարբերակները, որոնք բնութագրական են Միացյալ Նահանգներում տրված արտոնագրերի վերնագրերի համար: Մաս-

Ուսմանը հարմար պայմաններ ստեղծելու, որ արտոնագրի վերնագիրը կարելի է ներկայացնել միասնական կաղապարի սահմաններում: Հոդվածը նպատակ ունի օգնել օտարալեզու գիտնականին հեշտությամբ կաղապարել նյութի բովանդակությունը վերնագրի տեսքով, ինչպես նաև գործառական ոճագիտության շրջանակներում հաստատել այն փաստը, որ արտոնագրի վերնագիրը, այնպես ինչպես արտոնագրային փաստաթուղթն ամբողջապես, գիտական և պաշտոնական գործառական ոճերի համակցություն է, որտեղ գիտականի համար պատասխանատու է գիտական բառապաշարը, իսկ պաշտոնական կողմն արտահայտվում է կաղապարային կառույցների միջոցով: