

The Direction of The Development of the “Object Finder” from the Perspective of TRIZ Innovation

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Abstract. In order to promote the development of further research on the “object finder”, this paper aims to utilize the existing development mode and modern scientific and technological progress. By combining with the TRIZ innovation method, the shortcomings of the original plans are analyzed, intending to propose a new concept for the object finder, which consists of two components, i.e., “locator” and “searcher”. Additionally, this paper explores the development of both the “locator” and “searcher” respectively, to create a fresh development space for the object finder.

Keywords: Object Finder; Localization; Search; Scanning; Resonance.

1. Research Significance

According to incomplete statistics, 92% of people have lost their possession, and 65% of them often face such a problem. Looking for lost items in a pinch not only wastes time and puts people in an unpleasant mood, but also often makes people run the irreversible risk of losing their beloved things.....

With the quickening pace of life, a small, convenient, and practical “object finder” is occupying a large market. So, what can the TRIZ innovation method do for the development of this product?

2. Development Status

In 2005, an “object finder”, invented by several middle school students, walked into people’s sight for the first time. From 2005 to the present, increasingly advanced science and technology provide the “object finder” with new possibilities. In this nearly 20 years of development, from the reference to “remote control car technology” to the application of RFID technology, Bluetooth technology, and SCM technology, there is no exception that people associate “object finder” and “transmitter” with “receiver”. In this mode, the users are required to bind the receiver and the item in advance. When people look for the item, the transmitter emits the signal, and then the lost item can be found according to the sound and light signals emitted by the receiver after receiving the signal.

3. Thinking Innovation

It is worth recognizing that breakthroughs in technology have expanded the scope of the search, and the solution to the problem of distance has been clarified through the efforts of researchers. The “object-finding mode” of “letting lost objects make sounds” breaks the traditional “object-finding by people mode” (reverse thinking) to a certain extent, and has become a major highlight of the innovation. However, are there any other possibilities for the future development of “object finder”? The answer should be yes.

First of all, the purpose of an object finder is not to be a technology capable of finding items but to provide the owner with timely directions when they have requirements for lost items. (“Customers do not buy a drill, instead, they buy the hole in the wall.”) Therefore, we need an object finder that does not find things when the object finder thinks they should be found, but rather one that makes it possible for the clients to find things whenever it is needed. More specifically, the current model, which alerts when the connection is broken, cannot meet the authentic needs of the user.

Secondly, not only is the time of loss variable, but the items are also lost. (Nine-screen Approach) Under the current thinking, the user must bind the “object finder” to the items that may be lost in advance, and problems occur. Even if only important items are bound, not to mention the number of important items, the cost cannot be easily calculated, and it is difficult for users to identify what is important at first time. After all, a lot of ordinary and seemingly insignificant things often play a key role at a particular time. Therefore, a truly economical “object finder” needs to break through not only the limitations of the spatial scope but also the temporal limitation.

In addition, under the existing development model, the problem of replenishing the power of the “object finder” remains to be unsolved, and it is difficult to imagine that users still need to charge the “object finder” regularly and separately, which has already been successfully bound to the items.

Finally, in the context of new developments, it is inappropriate for researchers to follow the trend of technology and use mobile apps as “transmitters”. This involves a simple but deadly question: how to find a cell phone when it is lost? The unique function of the “object finder” determines that its development should not “follow the trend”. “Object finder” should be an independent device, and its degree of dependence on objective objects should be as low as possible. Its ideal condition is that even if the previous “object finder” has been lost, the new one is still able to find the lost object quickly.

4. Ideal Model

The “object finder” involves two devices, a “locator” and a “searcher”. The square locator is designed to find precious objects, and the spectacle-shaped object finder is used for general searches. (Integrity, coordination, and dynamics)

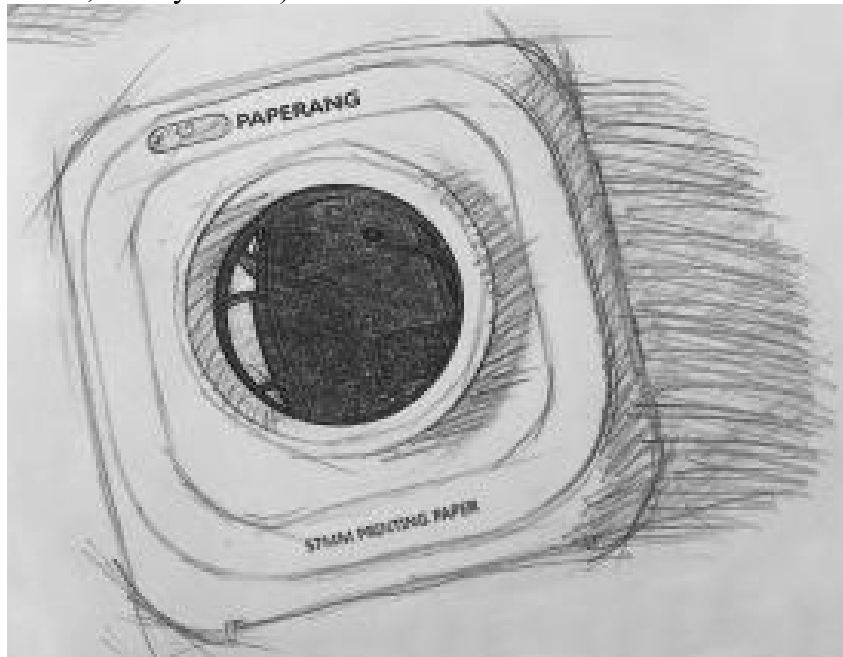


Figure 1. Locator

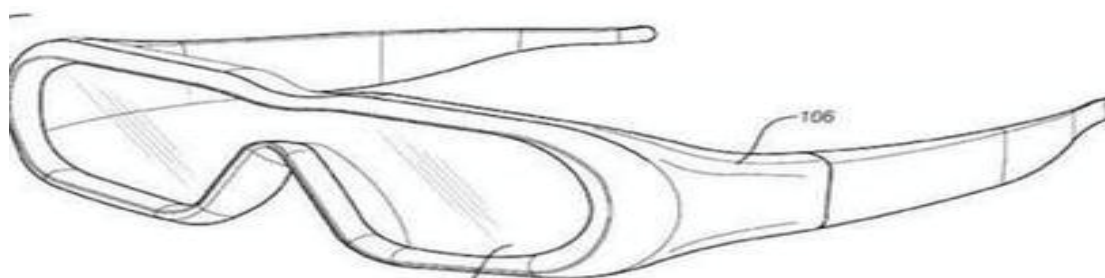


Figure 2. Searcher

4.1 Locator

Users register their own “search account” in the locator (The account can be logged in any locator of the owner). The locator has the following two functions:

4.1.1 Positioning of Important Items

Users can use the locator to scan the items that they deem to be important from time to time. After the scanning, the locator will assign a special number to the specific item and deposit the information into the user’s exclusive account. After that, the locator will track the important item in real time using positioning technology and determine the common location of the item according to the length of time it has been in the area and save it (storage methods and capacity refer to USB flash drive, cloud computing, etc.);

If the item has not been moved for a long period, the tracking of the item will go dormant to save power. When the user needs to find the item, the system will provide him with the exact location of the item after selecting the item that has been previously recorded in the system.

For special movements of items, the user can set them in advance in the locator’s display—if there is a concern about theft, the alarm can be set to receive its location in time.

4.1.2 Search for Lost Items

First, the locator can remind the user of the probable location of the lost item. With the authorization of the user, the locator positions the location of the user for a short period (the exact length of time to be specified by the user), and the user can refer to the “travel map” organized by the locator for him after losing the item.

Secondly, the locator supports all users to help each other find items. The traditional “search and finding” is time-consuming, labor-intensive, and inefficient, while the development of the internet and big data provides a new direction for its development. The locator will delineate the approximate range of the user’s activities over a period based on the aforementioned positioning. Users can send information about the lost items and the reward money in the “moment” of the locator so that their friends can contact the owner in time after finding the lost items.

4.2 Searcher

The searcher is used with the locator. For the unrecorded items, it can be searched for extensively by the searcher. Before the search begins, the user is required to enter the characteristics of the object he wants to search for on the page of the smart object finder. Once the user has completed the entry, he can put on the spectacle-shaped object finder. The search system will combine two sets of technologies to provide the user with a search service.

4.2.1 Scanning

Through scanning technology, the searcher can automatically shield itself from large obstacles. Alerts are sent out for users when items matching the characteristics are found.

However, the use of scanning technology is still limited by special substances such as lead, and therefore it requires the cooperation of “resonance technology”.

4.2.2 Resonance

After determining the type and size of the object to be searched, the searcher can conduct a “resonance search” (emitting sound waves that can cause a vibration of the object searched, and then determining its location through the sensors) in the place where the user goes according to the resonance frequency, and then the searcher extracts and saves data of the objects that meet the characteristics.

However, the resonance technology is not able to refine the specific characteristics of the item, so “scanning technology” is required. Once the user has finished the search, the searcher will organize and provide the results for the user, and then the user will have to identify what he is looking for in the possibilities offered by the search result.

However, due to security concerns, the scope of the application of the searcher should be limited, which means the search of specific places or areas should be encrypted in advance, e.g., by correctly entering the secret password or by accurately answering private questions. In addition, the use of searchers should generally be limited to private places such as residences, and the right to conduct “general searches” in public places should be left to state officials.

The locator is accurate in positioning and has a high probability of successful search; the searcher can achieve universal search, but the success rate is lower (among them, the more obvious the characteristics of the item are, the more accurate the description of the characteristics is, the greater the success rate is), and the two complement and cooperate.

5. Conclusion

The first person who found inspiration for the “object finder” from “finding a cell phone through its ringing” is worthy of respect, but technological development should not be limited to a development model, and should not be confined by inherent thinking. TRIZ model not only guides us to analyze the historical research results, but also teaches us to break the inherent thinking to create solutions from a new perspective. The future of the “object finder” is full of infinite possibilities. It is expected that the “object finder” knocks on the door of the people’s homes, and effectively solves the problem of “looking for lost items” for people!

Text noun translation:

寻物器 Object finder

定位仪 Locator

搜寻器 Searcher

长期 Long-term

短期 Short-term

根据物品特征，通过扫描、共振技术、在一定范围寻找匹配物 Scanning and resonance technology are used to find a match within a certain range based on the characteristics of the item

实时定位提前录入系统的物品（云端）Real-time localization of items is entered into the system in advance (cloud technology)

定位近期活动范围，发布网络寻物启事（朋友圈）Locate the recent activity range and publish online search notices (e.g., Moments)

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