

System To Control Of Fire-Arm License Based On The Psychic State Of The Civilian License Holder, Automatic Locking & Unlocking Of A Fire-Arm Based On Cognitive Visual Analysis.

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I. Background: What Is The Problem Solved By Your Invention?

The policy for issuance of a fire-arm mandates a certain eligibility criteria that includes purpose statement and licensee physical and mental health verification and accordingly, a license for a specified time interval is issued for the said fire-arm. Thus the fire-arm and licensee relationship is one on one and contained by the conditions of the license and its validity. However, in today's ever changing world, these parameters, particularly the psychometric parameters may get influenced by certain triggers in modern day life, and may not be consistent over the entire license issuing period. If there is a gross change happening on a negative side, it may turn into a trigger-happy situation and committing crime of some sort cannot be ruled out. Thus the current gaps can be listed as

1. There is no system in place that can monitor the licensee psychic condition based upon some benchmark – which in turn would modify the terms and conditions of the license issued, leading to an early renewal ask or even temporary / permanent short closure of the license and thereby locking / unlocking of the gun trigger vis-à-vis the modified license state.
2. There is no system in place to record the pattern of handling a firearm – which can be used as a baseline to determine an early renewal ask or even temporary / permanent short closure of the license.
3. There is no system in place to record biometric details, audio visual details and cognitively identify the visual context of the situation at the time of usage of the Firearm and control the locking and unlocking of the trigger based upon the in-field situation by analyzing the audio visual feeds, biometry, as well as referring similar events from the past records.

II. Related Work/Prior Art: Please List And Briefly Describe The Products, Publications, Patents, And Other Works That Are Most Closely Related To Your Invention. If Any Of These Works Solve Or Address The Same Problem, What Are The Drawbacks Of The Known Solution(S)?

1. <http://www.google.com/patents/US20140298701>
2. <http://patents.justia.com/patents-by-us-classification/42/70.11>
3. <https://www.dhs.gov/sites/default/files/publications/R-Tech%20Smart%20Gun%20Technology%20Patents%20for%20Micro%20Site%20DELIV%20160719-508C.pdf>
4. <http://www.google.co.in/patents/US7937880>

None of the above prior art, either solely or cumulatively describes any of the below claims of this disclosure:

1. System and method to control expiration date of any Fire-arm license automatically based on the psychic state of the user and pattern of handling a firearm.
2. System and method to control the locking and unlocking of a trigger of a Firearm based on the cognitive analysis of visual context at the time of triggering by determining the intent of panic situation and possibility of successful defense.
3. Suggesting the mode of action depending the analyzed situation.

III. Summary Of Invention: Briefly Describe The Core Idea Of Your Invention (Saving The Details For Question #3 Below). Describe The Advantage(S) Of Using Your Invention Instead Of The Known Solutions Described Above.

In our disclosure we are proposing a system which continuously monitors the trend of psychic state of the user using various IOT sensors and automatically alters the license conditions (prepones the expiration date of the license) and restricts the licensee to use that fire-arm without the conditions met. The system uses the technological advantage of IOT and blockchain.

We are also proposing a cognitive analysis of visual/video inputs available at the time of situation by gathering location details, time of occurrence of the situation and analyzing information of similar incidence resulted in report of death or hospitalization or audio / written statements as well as news reports. Based on the analysis the system will calculate the Panic Index and Defense Index and compare against the threshold. Depending on the outcome of the analysis the locking and unlocking of the trigger will be allowed.

We are also suggesting a mode of action depending on the analysis of the situation by evaluating the gravity of the threat and the licensee safety. For example if in a situation the threat is high but the licensee safety is low (even after using the fire-arm), a blank fire can be more effective – thus communicating the suggestion to the licensee and unlocking the trigger when there is no person in the visual scene. We have used two parameters to measure this situation namely panic index and defense index

Advantage:

This system will prevent crime by restricting the user to use the fire-arm.

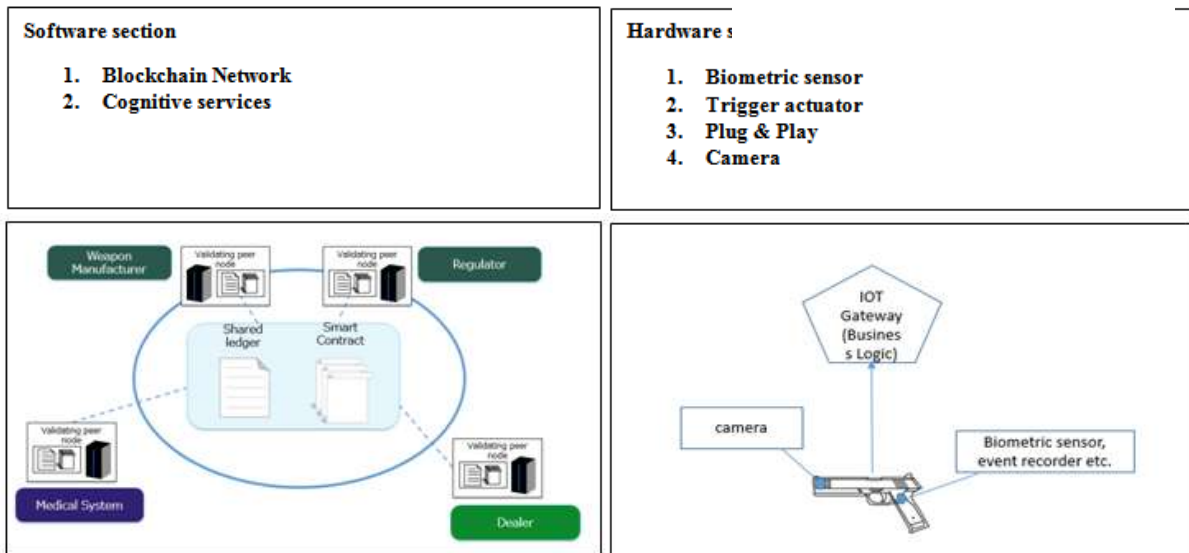
IV. Description: Describe How Your Invention Works, And How It Could Be Implemented, Using Text, Diagrams And Flow Charts As Appropriate.

Figure 1:

Implementation steps:

1. Make a business network in the blockchain involving all stakeholders (fire-arm manufacturer, regulatory body, law enforcement body, Dealer, medical system as well as usage).
2. Every fire-arm will be IOT sensor enabled like biometric etc. and will have a digital functionality to capture fire-arm activities such as cartridge change, number of bullets available within it, frequency of handling the fire-arm and also the functionality to digitally activate and deactivate the trigger etc.
3. The licensing procedure needs to capture the licensee's details that includes medical reports (physical and psychic conditions), biometric details and socio-economic details. Once the license is issued, these details will be inserted in the shared ledger(Blockchain). The system also set a psychic state threshold of the user based on details provided. This biometry details will be in two parts namely identification biometry (unchanged for a life time) and psychometric biometry (that changes over the psychic situation)
4. Now the system will continuously monitor the biometrics and store the psychic trend in blockchain. The monitoring includes when the firearm is in contact with living body even if the usage is not intended i.e. trigger is not touched. This information will be collected for contact with the licensee only based upon the identification biometric features.
5. If the psychic state of the licensee reaches to a threshold with respect to psychometric biometry, the terms and conditions of the license issued would be modified, which may include an early renewal ask or even temporary / permanent short closure of the license. The system would send notification to all the concerned stakeholders (regulatory authority, medical authority, law enforcement and the licensee).
6. The system will further allow the licensee to pull the trigger only when the modified license conditions are valid. Every transaction will be recorded in blockchain which makes the system full proof. The trigger will be blocked permanently for non-licensee based upon the identification biometric features of the licensee
7. The system captures various news feeds.
8. The system will capture the video/audio/visual feeds at the gunpoint using the camera attached to the gun along with time, location etc.
9. The system will then calculate panic index and defense index based on the data captured in step 7 and 8 [Refer table T1 and the description below].
10. The system will suggest the mode of action such as blank fire in a specific direction based on the panic index and defense index and only unlock the firearm upon the fulfilment of criteria. Example if the panic index is high and defense index is low, then system will suggest blank fire.
11. The system will only activate the trigger if the threshold index value is reached for panic and defense index calculated in step 9. The trigger control will include the suggestion mentioned in step 10 (eg if a blank fire is suggested, trigger will be unlocked only when there is no living object identified from visual context)

Overall System Flow:



1. User details that includes medical reports (physical and psychic conditions), biometric details and socio-economic details. Once the license is issued, these details will be stored in the software section 1.
2. License expiry date is set based on the consensus between the concerned parties in Software section 1.
3. Periodically all the data captured through hardware section 1-3 will be stored in software section 1.
4. This data is compared with the data present in software section 1. Depending on this comparison result the license expiry date is updated in software section 1.
5. Periodically data is captured through hardware section 4 and stored and analyzed in software section 2. This analysis of data in software section 2 is explained in details below.
6. Depending on response from software section 1 and 2 the activation of hardware section 2 will determined.

Event identified by analysis of Visual context Score s1	Location Score s2	Time Score s3	Report of death / hospitalization with Proximity to time and location Score s4	Audio or written statement of witnesses with Proximity to Location under similar event Score s5	News feed captured Score s6	Panic Index (Score * value)	Defense Index (Score * value)
v1	l1	t1	r1	a1	n1	P1	D1
v2	l2	t2	r2	a2	n1	P2	D2

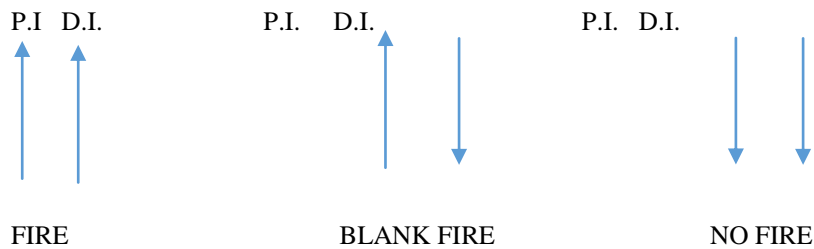
Table T1

V. Description Of Calculation Of Panic And Defense Index:

First the gunpoint situation is captured through the camera and then using cognitive services system will find out the context of the situation. Then the system search through the corpus already built from various media and news feeds and find out the data points which are having similar context. The system then segregates those data points in two groups with and without casualty. All the data points will be considered for calculating panic and defense index. Every data point will carry some weightage based on casualty level with or without fire-arm. If we take example of death then there will be four cases 1) Death with no Fire-Arm 2) Death with Fire-Arm 3) No Death with no Fire-Arm 4) No Death with Fire-Arm. This is just a representative model and the exhaustive decision model based on Panic index and Death index could be developed considering other casualty like injury etc.

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Now for calculating the panic and defense index the score/weightage will be different for above mentioned cases. Now to calculate the panic/defense index system will consider number of death, number of hospitalization etc. with the specified score value. Based on the panic and defense index together system will allow/restrict the user to defend himself using some fire-arm etc.



P.I – Panic Index

D.I – Defense index

Note: High P.I means higher life threat to the user, high D.I means high probability of defense if triggering is permitted.

[Disclaimer]: We are considering that there will be no conflict in personal/professional subject matter. In case of conflict the system will be able to recommend best approach of communication that can yield mutually agreeable work around. This is not applicable for organized Arm-Force, Military.