



This invention concerns the establishment and the payment of offence tickets issued by policemen in charge of ticketing vehicles parked illegally on public thoroughfares or guilty of other traffic offences, and relates particularly to an automated system for issuing and managing these offence tickets.

Currently, in most countries, the ticketing of vehicles on public thoroughfares by a police officer or traffic warden is carried out by manually filling in the date, time and parking location, as well as vehicle-related information such as the license number, make, etc. Once completed, the ticket is placed under the vehicle's windshield wiper. Once in possession of this document, the owner of the ticketed vehicle either pays the fine by buying a fine stamp in a tobacconist's shop, the fine stamp is then pasted on the ticket and sent to the Public Treasury as is the case in France, or pays the fine directly in a Post Office, a police station or tax office as is the case in most other countries.

Actually, this system presents several disadvantages. Specifically, the police officer who issued the ticket is faced with a tedious and time-consuming task as he/she must fill in, by hand and in duplicate, all of the information on the ticket and in the ticket book. This takes a considerable amount of time and is not particularly efficient. Furthermore, the administrative processing of the tickets is very difficult to manage.

Another major disadvantage stems from the fact that the ticket is placed under the vehicle's windshield wiper. If it rains once the ticket is placed on the vehicle's windshield, it becomes wet or even soaked, difficult to handle and often altered, making it unusable for the payment operation. In addition, as the tickets are simply placed under the windshield wiper, they are sometimes



removed as a joke or removed by dishonest motorists who place the ticket under the windshield wiper of their own vehicle in an attempt to avoid having a police officer place a ticket on it thinking that the vehicle has already
5 been ticketed. In such cases, the ticketed motorist is not aware that he/she received a ticket and will thus have to pay a higher fine when claimed at a later date, thereby increasing the already high volume of disputed tickets.

An offence ticket processing system described in
10 patent application FR-A-2.665.779 enables a certain number of the above-mentioned disadvantages to be solved, owing to the use of a portable self-contained terminal featuring an alphanumeric keyboard, a screen and a printer capable of printing a barcode on a traffic ticket entered by the
15 police officer using the keyboard. Unfortunately, insofar as the system described in document FR-A-2.665.779 still uses tickets made of paper or other alterable material, the disadvantage of having the ticket ruined by rain still exists, or of having the ticket removed from the ticketed
20 vehicle and placed on another vehicle, or even the barcodes falsified by an offender who wants to add or remove bars, thus making way to unacceptable forging possibilities in this sensitive application field, the implementation of which must be based on total security and reliability.

25 The system described in patent application PCT FR98/02509 enables the above-mentioned disadvantages to be offset by using an unalterable tamper-resistant smart card as a ticket medium which is clipped on the windshield wiper of the ticketed vehicle after the police officer has
30 recorded the information concerning the offence. To this end, he/she uses a portable input device in which he/she records all the offence tickets that he/she issued during his/her duty period. At the end of his/her duty period, the police officer returns to the police station where he/she

connects the portable input device by which the data relative to the offences recorded are automatically transmitted to the processing center. Unfortunately, this system presents the major disadvantage of only transmitting
5 the offences to the processing center at the end of the police officer's duty period, which may sometimes be several hours after they have been recorded. The police officer thus cannot know if the ticketed vehicle is stolen when the ticket is issued. In addition, in case the input
10 device becomes lost or stolen, the data pertaining to the recorded offences is permanently lost.

This is why the purpose of the invention is to provide a system for issuing and managing offence tickets in which the police officer has real-time access to information
15 related to the vehicle and in which the data relative to the offence is recorded immediately within the ticket processing center.

The object of the invention is thus a system for issuing and managing offence tickets comprising a portable input
20 device provided to the police officer in charge of ticketing a contravening vehicle for recording herein data concerning the vehicle, an unalterable tamper-resistant ticketing card adapted to be inserted into the input device so as to record therein the vehicle-related data, clipping
25 means enabling the police officer to clip the card onto the wiper arm such that the card is not damaged by rain and cannot be easily removed after it has been clipped, a viewing device provided with a display screen, a printer and a ticketing card reading means to enable the vehicle
30 owner to access data concerning the offence. The system further comprises a processing center containing the information relative to all registered vehicles included the hired vehicles, and access means to the cellular phone network located to enable the police officer to obtain

information concerning the ticketed vehicle from the processing center after having transmitted the ticketed vehicle's license number to the processing center via the cellular phone network.

5 The purposes, objects and features of the invention will become more apparent from the following detailed description with reference to the accompanying drawings, in which:

10 Figure 1 is a block diagram which schematically represents all of the elements of the system for issuing and managing offence tickets according to the invention,

 Figure 2 is a flow chart representing the operations to be performed in the system according to the invention, as shown in Figure 1,

15 Figures 3A and 3B represent an initial embodiment of the electronic ticketing card used in the system according to the invention, and

 Figures 4A and 4B represent a second embodiment of the electronic ticketing card used in the system according to
20 the invention.

 As depicted diagrammatically in figure 1, the police officer (or traffic warden) 10 is equipped with an input device 12 equipped with a GSM module for the access to the cellular phone network and possibly a GPS module enabling
25 the input device to be located automatically. The latter enables the police officer to issue all contravening vehicles 16 a ticketing card 14 which is a clippable electronic card of the smart card type, this unalterable and tamper-resistant ticket card constituting the essential
30 element of the system for issuing and managing offence tickets according to the invention. The input device 12 is in the form of a small hand-held unit, for example 15cm long, 10cm wide and 2cm thick. It is equipped with a waterproof alphanumerical keyboard, a 16-character two-line

screen, a card on which the electronic components are mounted, a rechargeable battery, a date/time stamping function and a smart card reader/recorder for the card type 14. It enables complex security algorithms to be computed
5 in complementarity with those of the card 14, and corresponding certificates to be written.

The plastic card 14 is rendered tamper-resistant by the use of complex algorithms and the storage of information in tamperproof zones. Preferably, this is a
10 smart card that is disposable, non-reusable and fully protected, especially from being copied. Providing these features is the only means of ensuring totally secure data processing.

The operation of the system according to the invention
15 illustrated in Figure 1 is depicted by the flow diagram represented in Figure 2.

Firstly, at the start of his/her duty period, the police officer identifies himself/herself by presenting his/her personal identification smart card in front of the
20 input terminal. Next, when the police officer wants to ticket a vehicle, he/she simply enters the vehicle's license plate number into the input device using a keyboard. As the input device is equipped with a GSM module, the license number is automatically transmitted by
25 the cellular phone network 20 (by means of the SMS procedure) to a ticket processing center 22. As the latter is connected to the vehicle registration file, the processing center immediately locates the vehicle corresponding to the license number. The vehicle's
30 characteristics (type, make, etc.) are then instantly retransmitted and recorded in the input device unless the vehicle is declared as stolen. If a vehicle is declared as stolen, the ticketing operation is not carried out and the

location of the vehicle is automatically reported to the processing center 22.

When the license number is entered into the input device by the police officer, the GPS module (when the device is so equipped) communicates the encrypted position of the input device to the processing center. This information is decrypted and instantly retransmitted unscrambled to the input device 12 at the same time as the vehicle-related information. While the police officer could enter the location data himself/herself, the use of the GPS module enables always exact positioning and automatic recording of the vehicle by the processing center, enabling the latter to automatically record stolen vehicles.

Finally, the input device records the following information (step 30):

1. the data entered by the police officer, namely the vehicle's license number and offence type,
2. the data supplied by the input device, namely the date and exact time (hour, minutes) and the legal articles or decree relative to the type of offence in question,
3. the data received from the processing center, that is whether the vehicle is reported as stolen, the vehicle type and make, and the vehicle's GPS position.

The information above, recorded in the input device, are then recorded (step 32) onto the card 14 which the police officer has inserted into the input device 12, and transmitted (step 31) via the cellular phone network 20 so that they can be recorded at the processing center 22 (step 33). Once the data is recorded on the card 14, the police officer clips it onto the vehicle's windshield wiper (step 34) using the clipping means described below.

The information recorded at the processing center 22 is automatically stored in a follow-up file 24 for a certain period of time (preferably 3 or 4 days). Access to

this follow-up file is only authorized to duly empowered individuals, such as police commissioners for example. In this manner, a police commissioner may be lenient on an offender and remove the offence from the follow-up file
5 during this storage period.

Upon returning to the vehicle, the vehicle owner recovers the card 14 by unclipping it from the windshield wiper and consults it (step 42) by means of a viewing device 18 which may be located in a tobacconist's shop or
10 in a tax office. Such a device includes a display screen on which all of the information concerning the offence is displayed as soon as the ticketing card is presented in front of the card reader provided for this purpose, and a document with the same information is printed. It should be
15 noted that the viewing devices may also be consultation terminals installed on thoroughfare or in strategic locations such as service stations, supermarkets, parking lots, etc.

The viewing device 18 may also have a second slot that
20 can be used to allow the offender, or any other person in possession of the ticket card, to pay the fine. In the case where this payment may be made (step 44), the person responsible for collecting the payment at the tobacconist's shop or tax office records (step 46) this payment to the
25 processing center in the viewing (and payment) device 18 and a receipt is issued to the person making the payment. It should be noted that if the viewing device is a payment terminal, payment can only be made by bank card. In this case, a receipt is issued by the terminal and the latter
30 automatically transmits the information relative to the payment to the processing center 22.

All payments made using a viewing (and payment) device 18 are transmitted to the processing center. In this case, each payment made by means of one of the viewing and

payment devices deletes the information contained in the follow-up file 24 if said payment is made during the storage period. In addition to receiving fine payments, it should be noted that the role of the processing unit 22 is to send out reminders and apply late fees for payment delays and to handle information requests and appeals.

In order to prevent the card from being removed too easily from the windshield of the contravening vehicle, the ticket card is equipped with a clipping means described below.

According to an initial embodiment, which is not restrictive, illustrated in Figures 3A and 3B, the ticketing card 14 includes an opening 50 having a slot 52 continuing down its side. A special cut-out 54 is made at the outside end of this slot on the edge of the card.

The card is clipped by pressing the special cut-out 54 against the wiper arm 55. The cut-out makes separating the slot 52 easier and facilitates the installation by pivoting the card on the wiper arm until the arm is fully within the orifice 50. The type of material used to make these cards enables its deformation characteristics to be used in attaching it to the wiper arm 55. The stiffness of the material provides efficient means of clipping the card onto the wiper arm.

To remove the ticketing card 14 from the arm 55, one simply has to firmly pull on the card. The notch 56 creates a frangible zone which allows the card to rip and to be easily removed from the windshield wiper arm, thus preventing any future reuse of the card clipping system.

According to a second embodiment depicted in figures 4A and 4B, the card 14 features a rounded opening 60 and a triangular V-shaped slot 62. A solid arrow-shaped part 64 defining the rounded opening 60 consists of a point 66 and two barbs 68. The wiper arm 70 is locked in the opening 60

by inserting the wiper arm between the point 66 and the notched edge 72 of the card. Once in the opening 60, the point 66 is inserted into the triangular V-shaped slot 62. The plastic nature of the card enables its deformation possibilities to allow the arrow 64 to be inserted into the slot 62. Once the arrow 64 is completely entered in the slot 62, the barbs 68 prevent it from exiting the slot as the barbs 68 are blocked in the base of the slot when it is pulled. The flexibility of the plastic material allow it to deform around the precut part 74 which acts as a hinge.

To remove the card 14 from the arm 70, one simply has to pull firmly on the card. The hinge part 74 comprising a frangible zone owing to its special cut-out, rips and releases the card from the windshield wiper arm thus preventing any future reuse of the card clipping system.

It should be noted that an essential characteristic of the system according to the invention is the use of rapid communication technologies. In this respect, the system could use new technologies such as GPRS and UMTS called upon to replace the GSM system as well as the DAB system.

Improvements could be made to the input device without deviating from the scope of the invention. In this manner, it can be equipped with a touch screen and a virtual keyboard. In addition, the input device may be equipped with a fingerprint reader or a voice recognition program enabling to enter data without using the keyboard. Furthermore, the input device may be equipped with a miniature camera which would enable someone to be filmed or photographed during an identity check by the police officer and to automatically send the fingerprint, the film or photo to an appropriate file in order to verify the identity of the person.

1 CLAIMS

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3 1. A system for issuing and managing offence tickets
4 including:

5

6 - a portable input device (12) provided to the
7 police officer (10) in charge of ticketing a
8 contravening vehicle (16) for vocally recording
9 therein the data relating to said vehicle,

10

11 - an information medium such as a contactless chip
12 card that cannot be tampered with (14) to be
13 issued to the owner of said vehicle and adapted to
14 be presented in front of said input device so as
15 to record therein the data relating to said
16 vehicle inputted using said input device upon
17 instruction by the police officer,

18

19 - clipping means enabling the police officer to clip
20 said information medium onto the windshield wiper
21 arm (55), such that said medium is not damaged by
22 rain and cannot be easily removed after having
23 been clipped,

24

25 - a consultation device (18) provided with a display
26 screen, a printer and a means for reading said
27 information medium in order to enable the vehicle
28 owner to read and print the data relating to the
29 offence displayed on said display screen,

30

31 - an information processing center (22) containing
32 data relating to all registered vehicles, and

1 - microwave radio link transmission means (20)
2 located in said input device to enable the police
3 officer to obtain said data relating to the
4 contravening vehicle from the information
5 processing center once he has transmitted by
6 microwave radio link the registration number of
7 said contravening vehicle to the information
8 processing centre.
9

10 2. The system according to claim 1 in which said
11 consultation device (18) is at the same time a payment
12 device enabling the vehicle owner to pay the fine, the
13 information relative to which were recorded in the
14 information medium (14).
15

16 3. The system according to claim 1 or 2, further
17 including a follow-up file (24) designed to record the
18 information transmitted by said data acquisition
19 terminal during a predetermined time prior to
20 processing.
21

22 4. The system according to any one of claims 1, 2 or 3,
23 in which said processing center (22) has automatic
24 access to the vehicle registration file so that said
25 input device (12) immediately receives the information
26 indicating whether the vehicle is stolen in answer to
27 the transmission of the vehicle license number by said
28 input device.
29

30 5. The system according to any one of the previous claims
31 in which said input device (12) includes a miniature
32 camera enabling the driver of the vehicle to be filmed

1 or photographed and to transmit the photo to said
2 processing center (22) in order to obtain the
3 identification of said driver in return.
4

5 6. The system according to any one of claims 1 to 5 in
6 which the clipping means of the information medium
7 (14) consist of an opening (50) prolonged by a slot
8 (52) terminated on the edge of the information medium
9 by a special notch (54) enabling the wiper arm (55) to
10 be inserted into the slot until it penetrates said
11 opening.
12

13 7. The system according to claim 6, in which a notch (56)
14 located in said opening (50) forms a frangible zone
15 enabling said information medium (14) to be separated
16 from the windshield wiper arm (70) by pulling firmly
17 on said medium in order to rip it starting from said
18 notch.
19

20 8. The system according to any one of claims 1 to 5, in
21 which said clipping means of the information medium
22 (14) consist of an arrow-shaped part (64) comprising a
23 point (66) and two barbs (68), and a triangular V-
24 shaped slot (62) enabling said arrow-shaped part to be
25 inserted into said slot once the windshield wiper arm
26 (55) has been introduced into a rounded opening (60)
27 delimited by said arrow-shaped part.
28

29 9. The system according to claim 8, in which a hinge part
30 (74) connecting the arrow-shaped part (64) to the rest
31 of the information medium is a frangible zone enabling
32 said information medium (14) to be separated from the

1 windshield wiper arm (55) by pulling firmly on said
2 information medium in order to rip it
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