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(54) **Shopper proximity sensor and message initiation**

(57) A marketing device includes a customer proximity detector (26-32), a storage device (24), a message output block (22) and a microprocessor (20). The customer proximity detector (26-32) detects proximity of a customer. The storage device (24) stores a message. The message output block (22) communicates the message. The microprocessor (20), in response to detection of customer proximity by the customer proximity detector (26-32), causes the message output block (22) to communicate the message.

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Description

BACKGROUND

FIELD OF THE INVENTION

[0001] The present invention concerns marketing of products and pertains particularly to sensing the proximity of shoppers and initiating a sales message.

RELATED INFORMATION

[0002] When engaging in commercial enterprises, information about customers and their habits can be very beneficial for those engaged in marketing products. There have been some attempts to monitor customer activity and to make this information available to the proprietors of commercial establishments.

[0003] For example, United States Patent Number 5,138,638 issued on August 11, 1992 to Ronald G. Frey, for SYSTEM FOR DETERMINING THE NUMBER OF SHOPPERS IN A RETAIL STORE AND FOR PROCESSING THAT INFORMATION TO PRODUCE DATA FOR STORE MANAGEMENT, sets out a system for automatically counting people as they move past a selected location, and for measuring their heights.

[0004] Likewise, United States Patent Number, 5,250,941 issued on October 5, 1993 to Peter L. McGregor, and Lily Cohen-Miller, for CUSTOMER ACTIVITY MONITOR, sets out a system for sensing the proximity of a customer, automobile or other moving entity.

[0005] While these customer sensor systems provide some information about the numbers of customer, the information provided is very limited and only of marginal help in the marketing of products.

SUMMARY OF THE INVENTION

[0006] In accordance with the preferred embodiment of the present invention, a marketing device includes a customer proximity detector, a storage device, a message output block and a microprocessor. The customer proximity detector detects proximity of a customer. The storage device stores a message. The message output block communicates the message. The microprocessor, in response to detection of customer proximity by the customer proximity detector, causes the message output block to communicate the message.

[0007] The present invention allows a retail store and/or product marketer to bring a sales message directly to a shopper. Over 80% of buying decisions are made at the store when choosing between competing products. The present invention allows the delivery of an audio or visual sales message for a specific product when the shopper is making this buying decision. This is an improvement over traditional television, radio and print advertisements typically used to deliver advertising messages. Additional optional features of the present invention, such as counting the number of shoppers passing and recording the tarry time of each shopper, provides a marketer with specific traffic data useful for marketing products.

BRIEF DESCRIPTION OF THE DRAWINGS

[0008]

Figure 1 is a simplified block diagram of hardware used to implement a shopper counter and automated message delivery system in accordance with a preferred embodiment of the present invention.

Figure 2 is a simplified block flowchart that illustrates software operation of a shopper counter and automated message delivery system in accordance with a preferred embodiment of the present invention.

Figure 3 is a simplified diagram of housing for a shopper counter and automated message delivery system in accordance with a preferred embodiment of the present invention.

Figure 4, Figure 5, Figure 6 and Figure 7 are examples which show how information obtained from the shopper counter and automated message delivery system can be displayed in graphical form.

DESCRIPTION OF THE PREFERRED EMBODIMENT

[0009] Figure 1 is a simplified block diagram of hardware used to implement a shopper counter and automated message delivery system.

[0010] A driver 30 drives an infrared transmitter diode 31 to produce an infrared transmission signal 35 transmitted through a lens 33. A detector diode 32 detects a returning infrared signal 36 through a lens 34. A DC cancel circuit 29

is used to filter out ambient light before the remaining signal is amplified by an amplifier 28. A peak detector 27 and an amplifier 26 further process the signal in preparation for analysis by a microprocessor 20. Microprocessor 20 is clocked by a signal generated by a resonator 21. Microprocessor 20 controls driver 30 and receives feedback from peak detector 27 and amplifier 26 in order to detect the proximity of shoppers. In the preferred embodiment, driver 30, DC cancel block 29, amplifier 28, peak detector 27 amplifier 26 and infrared data transmission (IrDT) input/output (I/O) 25 are embodied on a single application specific integrated circuit (ASIC).

[0011] Upon detecting the proximity of shoppers, microprocessor 20 counts the shoppers. In addition, when the feature is activated, microprocessor records the duration each shopper is present. In addition, when the feature is activated, microprocessor 20 causes a message output block 22 to play a message stored in message storage 24.

[0012] In the preferred embodiment message storage 24 stores one or more audio messages. In this case, message output block 22 includes a voice synthesis integrated circuit and a speaker. In alternative embodiments of the present invention, message storage 24 stores, for example, an audio/visual message and message output block 22 is used to drive an audio/video display monitor. In the preferred embodiment, message storage 24 consists of, for example, electronically erasable programmable read only memory (EEPROM), non-volatile random access memory (RAM), volatile RAM with a back-up power source, or some other form of storage. In alternative embodiments of the present invention, when, for example, audio/visual messages are stored, higher volume storage media (such as a CD ROM, DVD ROM and/or hard disk) can be utilized.

[0013] In the preferred embodiment, statistical data stored by microprocessor 20 is accessed via IrDT I/O port 25 and a lens 37. A power supply 23 connected to round 38 supplies power for the shopper counter and automated message delivery system. Power supply 23 is, for example, a battery. Alternatively, power supply 23 may be a direct current (DC) power source, an alternating current (AC) power source, or another type of power source.

[0014] Figure 2 is a simplified block flowchart that illustrates a subroutine utilized by microprocessor 20 upon the detection of a shopper. The subroutine is started in a step 41 when a shopper is detected. In a step 42, a check is made to see if the timer feature is active. The timer is used to keep track of the length of time a particular shopper is present in front of the shopper counter and automated message delivery system.

[0015] If the timer feature is activated; in a step 43, the timer is started. In a step 44, a check is made to see if the message feature is active. The message feature is used to deliver a message to a shopper.

[0016] If the message feature is activated, in a step 45, a check is made to see if the message is currently running. If the message is not currently running, in a step 46, the message is played for the shopper. As discussed above, depending upon the embodiment of the present invention, the message is an audio message or an audio/visual message. In the preferred embodiment, there is a guaranteed pause of 10 seconds before a message is replayed. This delay can be omitted, for example, when there are more than one recorded message which are played in series.

[0017] In a step 47, the subroutine waits for the shopper to leave. When the shopper counter and automated message delivery system no longer detects a shopper, in a step 48, a check is again made to see if the timer feature is active. If the timer feature is activated, in a step 49, the timer count is recorded. In a step 50, the subroutine returns with the timer count (if the timer count is activated). Microprocessor 20 records the time the shopper was detected and (when the timer is activated) the duration the shopper remained. For example, Table 1 below shows sample records stored by microprocessor 20 for detected shoppers:

Table 1

Shopper #	Time Shopper Detected:	Tarry Duration
1	08:30:25	00:54
2	08:37:44	00:03
3	08:39:04	00:12
.	.	.
.	.	.
.	.	.
n-1	16:53:35	01:03
n	16:57:58	00:11

[0018] As shown by Figure 3, the preferred embodiment of the present invention is battery-powered and housed in

a miniature housing 60 made, for example, of plastic. Miniature housing 60 is attached to a product shelf 62. Visible on the front of miniature housing 60 are lens 33, lens 34 and lens 37. A speaker 61 is also seen. Speaker 61 is part of message output block 22 (shown in Figure 1). As described above, IrDT I/O block 25 (shown in Figure 1), accessible through lens 37, can be used to upload messages from a portable personal computer and to download statistical information about shoppers. As is indicated above, IrDT I/O block 25 may be imbedded in the proximity functional components and is not necessary a separate component.

[0019] Figure 4, Figure 5, Figure 6 and Figure 7 are examples which show how information obtained from the shopper counter and automated message delivery system can be displayed in graphical form. Figure 4 shows a graph 71 that gives a total count over a single period from August 9 through August 15. Figure 5 shows a graph 81 that gives a count for each day for the period from August 9 through August 15. Figure 6 shows a graph 91 that gives a count for four periods during a single day. Figure 7 shows a graph 101 that gives an hourly count over a single day.

Claims

1. A marketing device comprising:

a customer proximity detector (26-32) for detecting proximity of a customer;
storage device (24) for storing a message;
a message output block (22) for communicating the message; and,
a microprocessor (20), coupled to the customer proximity detector (26-32), the storage device (24) and the message output block (22), microprocessor (20) programmed to, in response to detection of customer proximity by the customer proximity detector (26-32), cause the message output block (22) to communicate the message.

2. A marketing device as in claim 1 wherein the microprocessor (20) is additionally programmed to count a number of customers detected by the customer proximity detector (26-32).

3. A marketing device as in claim 2 wherein the microprocessor (20) stores a tarry time for each customer detected by the customer proximity detector (26-32).

4. A marketing device as in claim 2 additionally comprising:

a wireless communication port (25), coupled to the microprocessor (20), the wireless communication port (25) allowing the microprocessor (20) to output information about customers detected by the proximity detector (26-32).

5. A marketing device as in claim 4 wherein the wireless communication port (25) also facilitates a new message to be uploaded to the marketing device.

6. A marketing device as in claim 1 additionally comprising:

a battery (23) used to power the customer proximity detector (26-32), the storage device (24), the message output block (22) and the microprocessor (20); and,
housing (60) for housing (60) the customer proximity detector (26-32), the storage device (24), the message output block (22), the microprocessor (20) and the battery (23), wherein the housing (60) facilitates mounting on a product shelf (62).

7. A computer implemented method for marketing a product comprising the following steps:

(a) detecting when a shopper is in proximity of a product display;
(b) upon detection that a shopper is in proximity of the product display, performing the following substep:

(b.1) starting a message pertaining to the product; and,

(c) upon detection that the shopper is no longer within proximity of the product display, performing the following substep:

(c.1) storing data about the shopper including a duration of time in which the shopper was in proximity of

the product display.

8. A computer implemented method as in claim 7 wherein in substep (b.1) the message is an audio message.

9. A computer implemented method as in claim 7 wherein in substep (b.1) the message is an audio/visual message.

10. A computer implemented method as in claim 7 additionally comprising the following step:

(d) downloading to a personal computer, via an infrared data transmission, statistical data on shoppers.

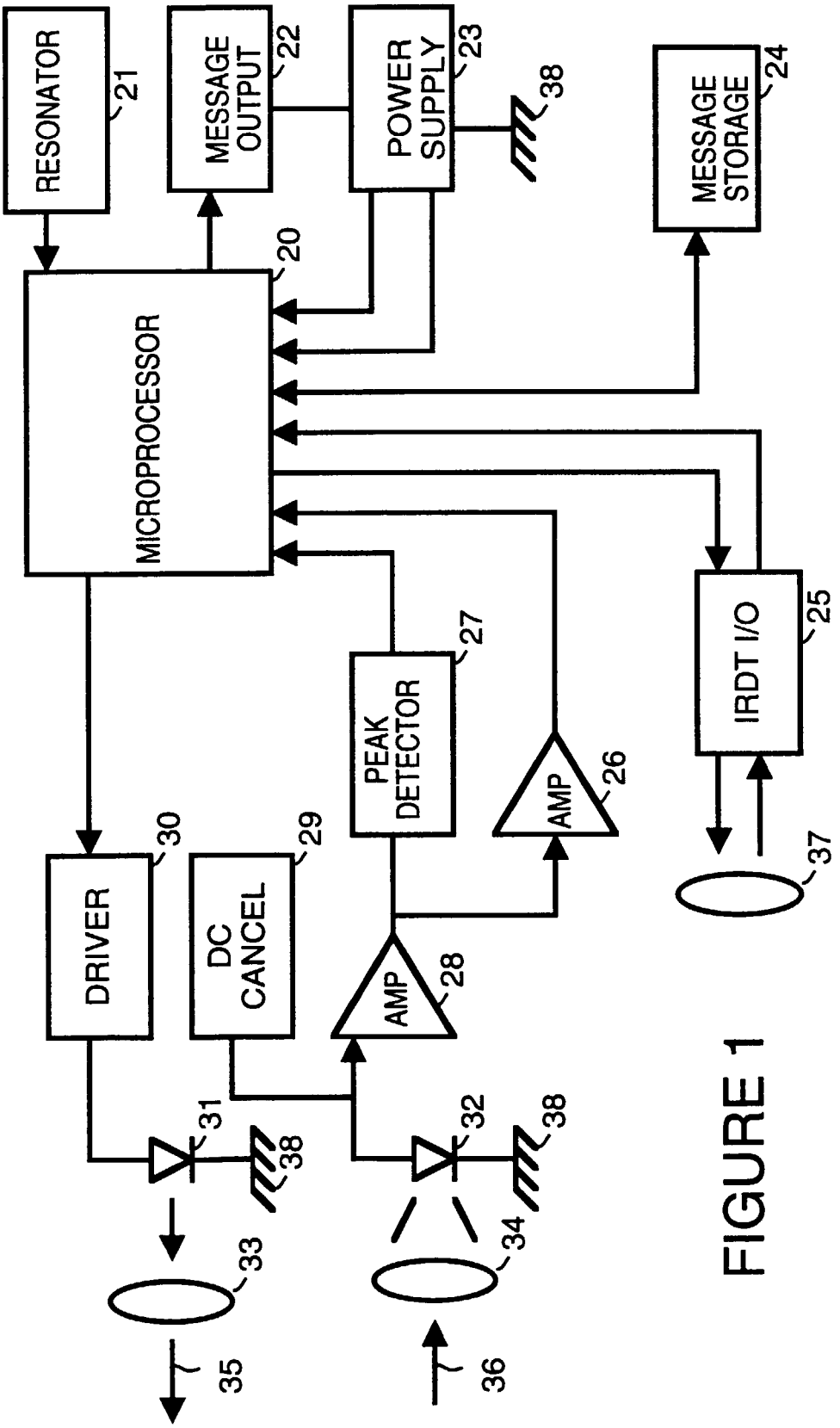
RESONATOR
21
MESSAGE OUTPUT
22
POWER SUPPLY
23
38
MESSAGE STORAGE
24
20
MICROPROCESSOR
IRDT I/O
25
27
PEAK DETECTOR
AMP
26
30
DRIVER
29
DC CANCEL
AMP
28
37
31
38
32
38
33
34
35
36

FIGURE 1

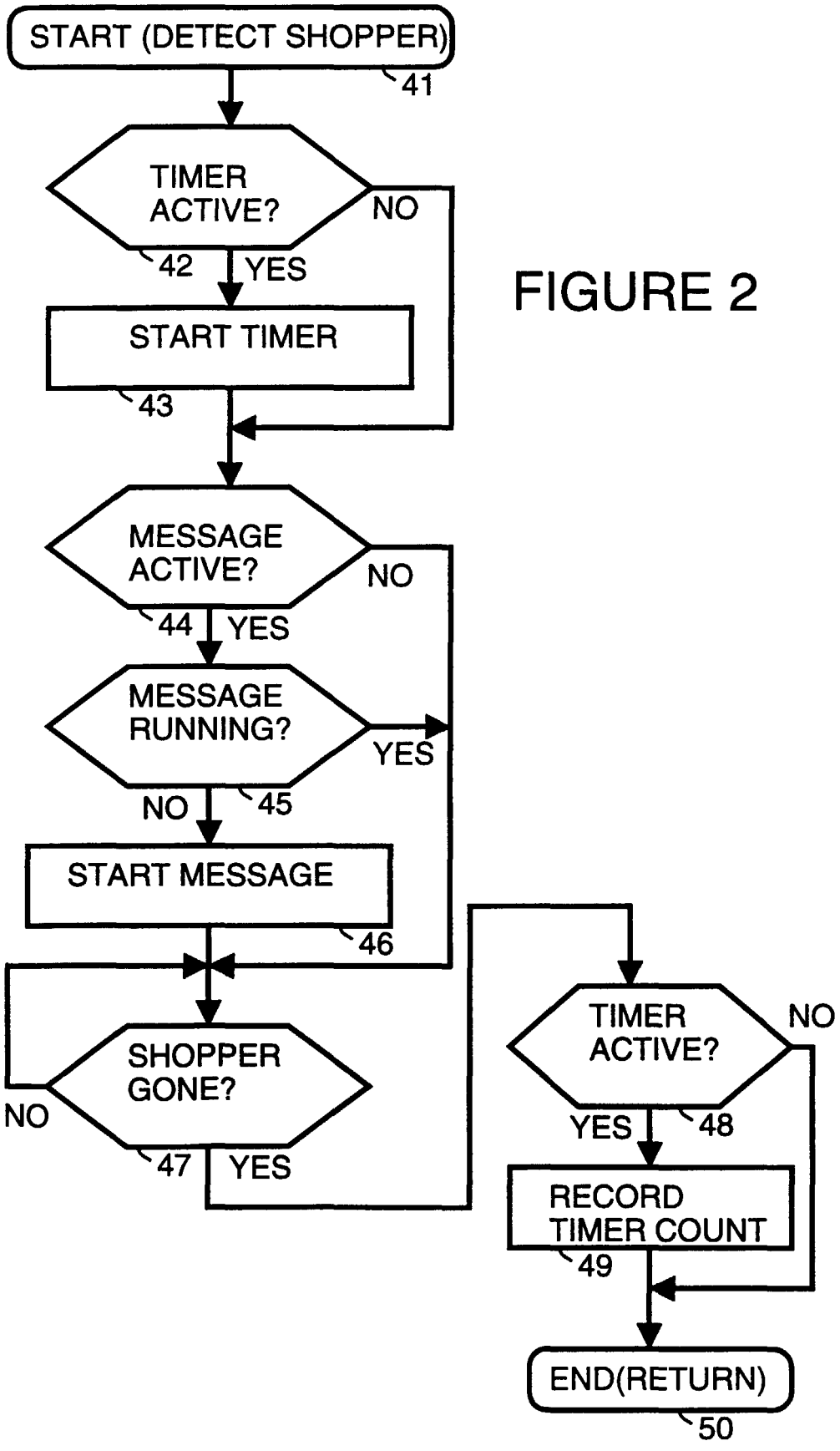
START (DETECT SHOPPER)
41
TIMER ACTIVE?
NO
42
YES
START TIMER
43
MESSAGE ACTIVE?
NO
44
YES
MESSAGE RUNNING?
YES
NO
45
START MESSAGE
46
SHOPPER GONE?
NO
47
YES
TIMER ACTIVE?
NO
YES
48
RECORD TIMER COUNT
49
END(RETURN)
50

FIGURE 2

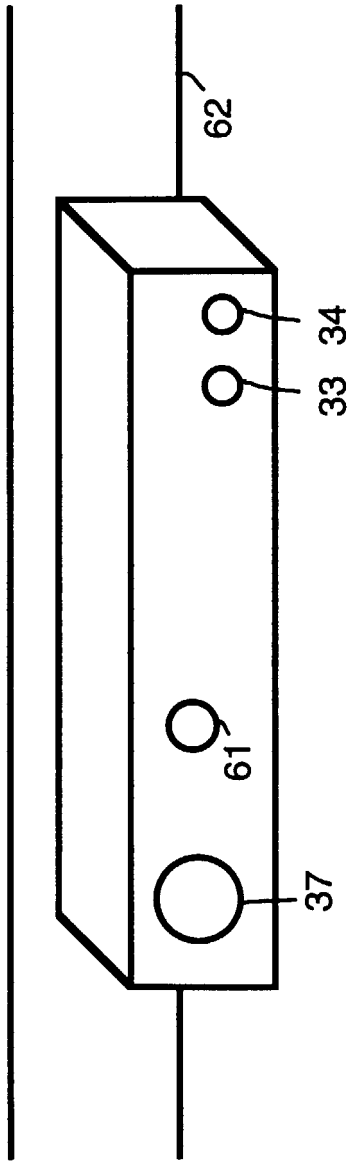

FIGURE 3

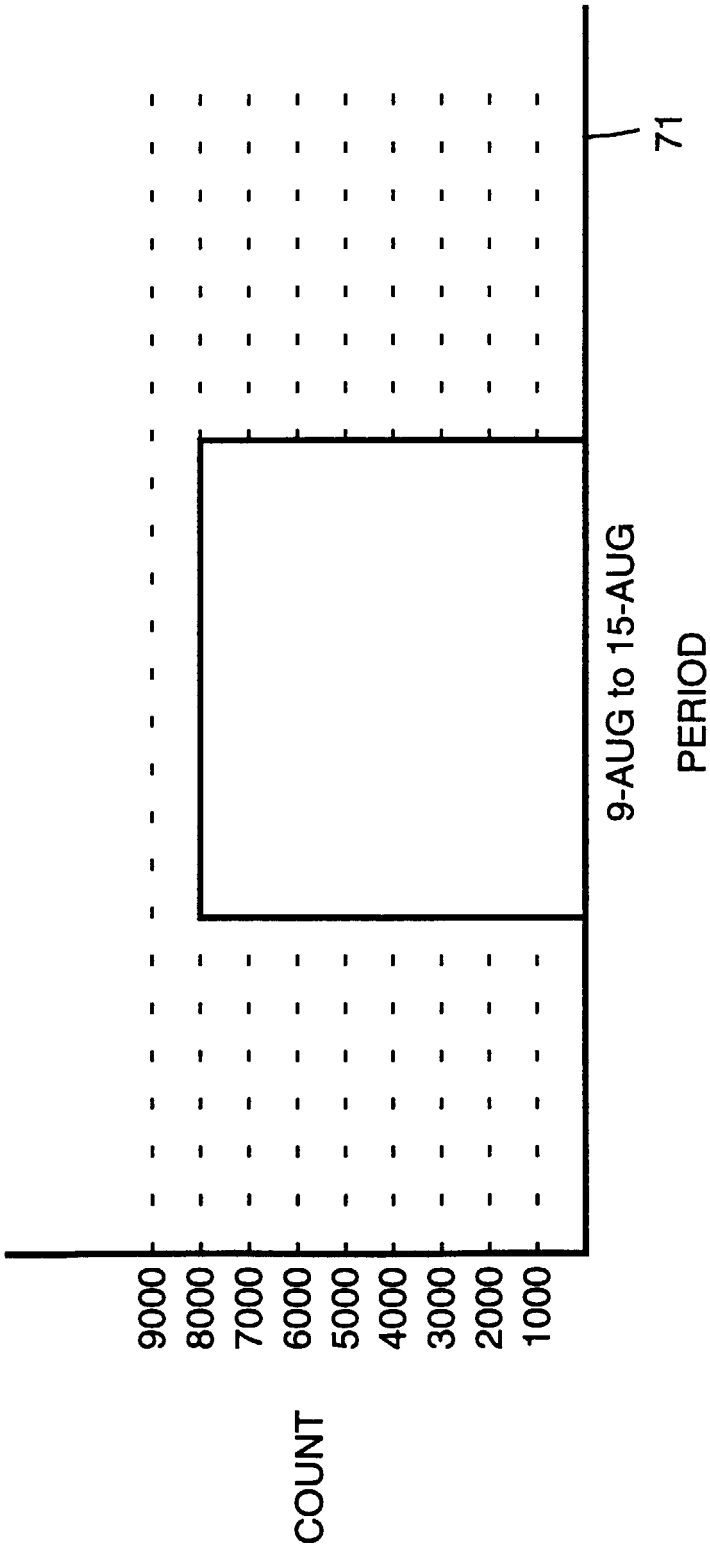
9000
8000
7000
6000
5000
4000
3000
2000
1000
COUNT
9-AUG to 15-AUG
PERIOD
71

FIGURE 4

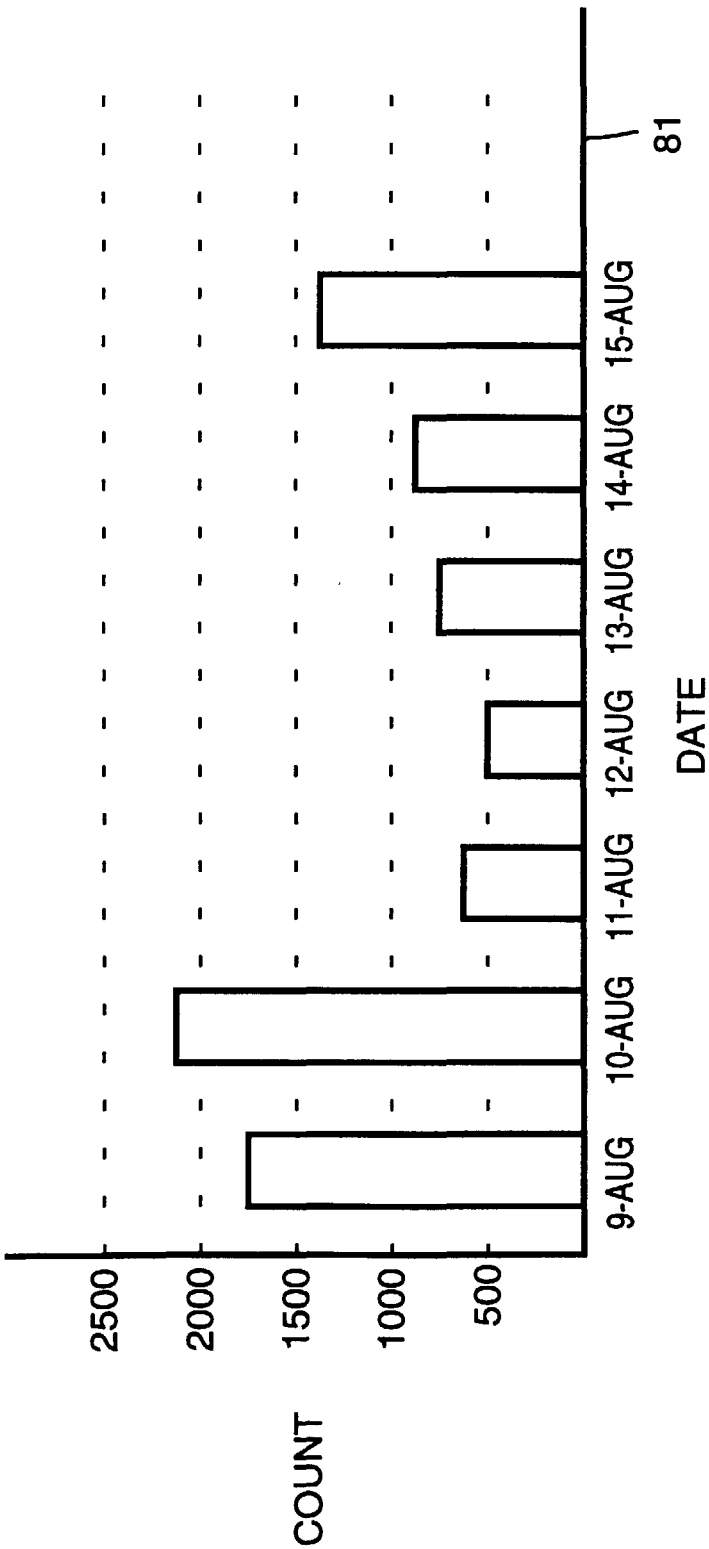
2500
2000
1500
1000
500
COUNT
9-AUG
10-AUG
11-AUG
12-AUG
13-AUG
14-AUG
15-AUG
DATE
81

FIGURE 5

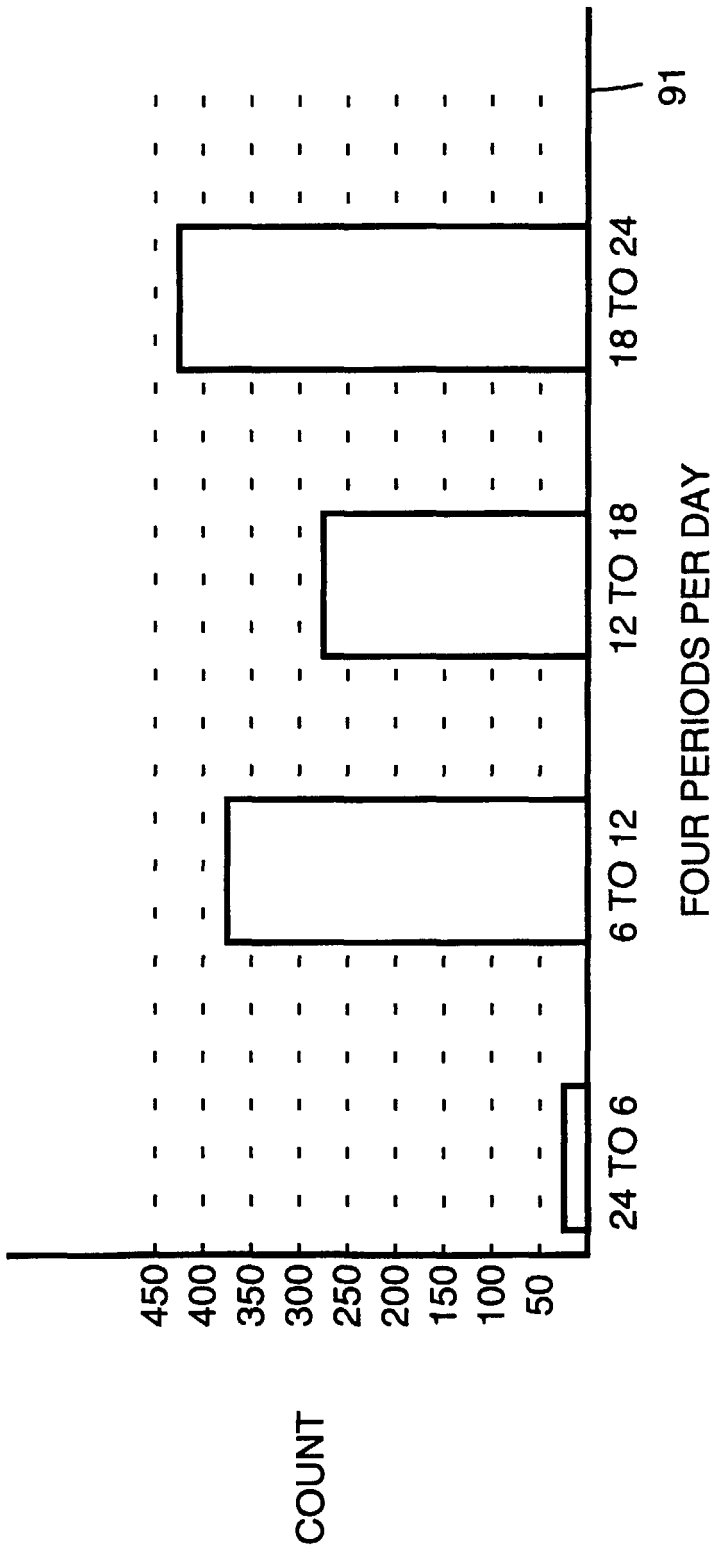
COUNT
450
400
350
300
250
200
150
100
50
24 TO 6
6 TO 12
12 TO 18
18 TO 24
FOUR PERIODS PER DAY
91

FIGURE 6

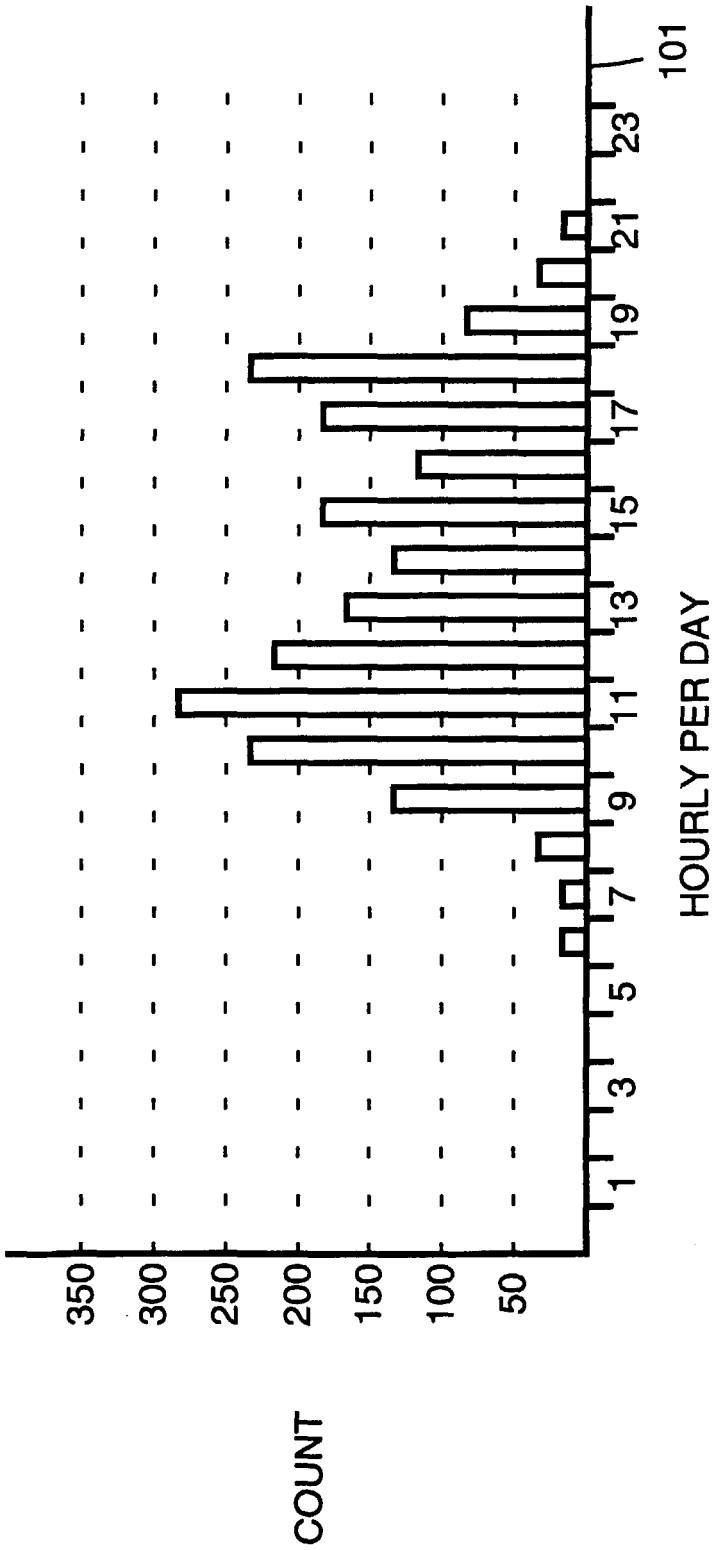
350
300
250
200
150
100
50
COUNT
1
3
5
7
9
11
13
15
17
19
21
23
HOURLY PER DAY
101

FIGURE 7

European Patent Office

EUROPEAN SEARCH REPORT

Application Number
EP 00 10 1145

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.7)
X	US 5 485 139 A (TARNOVSKY GEORGE V) 16 January 1996 (1996-01-16) * column 4, line 34 - line 44; claims; figures *	1-8,10	G09F27/00
X	DE 197 26 413 A (KUSSMAUL FRIEDHELM) 7 January 1999 (1999-01-07) * the whole document *	1-10	
X	FR 2 703 499 A (ROBINE BRUNO) 7 October 1994 (1994-10-07) * the whole document *	1-3,6-9	

TECHNICAL FIELDS SEARCHED (Int.Cl.7)

G09F

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	26 April 2000	Gallo, G

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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EPO FORM 1503 03.82 (P04C01)

ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 00 10 1145

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26-04-2000

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 5485139 A	16-01-1996	NONE	
DE 19726413 A	07-01-1999	NONE	
FR 2703499 A	07-10-1994	NONE	

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For more details about this annex : see Official Journal of the European Patent Office, No. 12/82