



- (51) **International Patent Classification:**
G06F 1/16 (2006.01)
- (21) **International Application Number:**
PCT/IN2013/000075
- (22) **International Filing Date:**
4 February 2013 (04.02.2013)
- (25) **Filing Language:** English
- (26) **Publication Language:** English
- (30) **Priority Data:**
2531/MUM/2011 8 March 2012 (08.03.2012) IN
- (72) **Inventor; and**
- (71) **Applicant** (for all designated States except US): **BHEDA, Nayan** [IN/IN]; 10, Prabhat P.M. Road, Ville Parle (East), Mumbai-400 057, Maharashtra (IN).
- (72) **Inventors; and**
- (71) **Applicants** (for US only): **BHEDA, Nayan** [IN/IN]; 10, Prabhat P.M. Road, Ville Parle (East), Mumbai-400 057, Maharashtra (IN). **HALDE, Nilesh** [IN/IN]; 2, Sachin CHS., 113 Model Town, Seven Bungalows, Andheri (West), Mumbai-400 053, Maharashtra (IN).
- (74) **Agents:** **KHADILKAR, Muralidhar Shrikrishna** et al.; K21.P.R. (Patent & Trademark Attorneys), 702, Rehman House, 18/A, Nadirsha Sukhia Street, Behind Prospect Chambers, Fort, Mumbai-400 001, Maharashtra (IN).

(81) **Designated States** (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BN, BR, BW, BY, BZ, CA, CH, CL, CN, CO, CR, CU, CZ, DE, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LT, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PA, PE, PG, PH, PL, PT, QA, RO, RS, RU, RW, SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, TH, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

(84) **Designated States** (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH, GM, KE, LR, LS, MW, MZ, NA, RW, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, RU, TJ, TM), European (AL, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, MC, MK, MT, NL, NO, PL, PT, RO, RS, SE, SI, SK, SM, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Declarations under Rule 4.17:

— of inventorship (Rule 4.17(iv))

Published:

— without international search report and to be republished upon receipt of that report (Rule 48.2(g))

(54) **Title:** A DOCKING SYSTEM TO MOBILE COMPUTING DEVICES ADDING FUNCTION OF TRANSACTION, SHOPPING, POINT OF SALE (POS) MACHINE, ENTERTAINMENT AND NETWORKING TO MOBILE DEVICE

(57) **Abstract:** The invention relates to a docking system to Mobile Computing Devices adding function of transaction, shopping, Point of Sale (POS) machine, entertainment and networking to mobile computing device 1. The device comprises a casing body (CB) having circuit board. On the said circuit board, an Ethernet card, barcode scanner module, TV and FM tuner, magnetic strip reader module, RFID reader module, remote control with infrared receiver module, speakers and microphone mounted and electrically connected to the USB hub. At front side of said casing body a U-shaped frame member (F) having the gap identical to the size of mobile computing device. The said U-shape frame members having groove means provided for slide ably mounting the said mobile computing device. The docking connector means provided for connecting to port of said MCD. A swiping slot provided on the one side of said frame electrically connected to the said bar code scanner module. The external sockets provided on the said casing body for USB interface, AV in for digital TV, head phone interface, analogue TV input and Ethernet connection. A power pack with battery backup controlled by a switch provided for power supply to circuit board.



TITLE:-

**A DOCKING SYSTEM TO MOBILE COMPUTING DEVICES ADDING FUNCTION
OF TRANSACTION, SHOPPING, POINT OF SALE (POS) MACHINE,
5 ENTERTAINMENT AND NETWORKING TO MOBILE DEVICE**

NATURE OF INVENTION:-

10 Invention relates a Docking system to Mobile Computing Devices adding function of transaction, shopping, Point of Sale (POS) machine, entertainment and networking to mobile device.

BACK GROUND OF INVENTION:-

15 Mobile devices are gaining ground in the markets today. Experts say that people would easily migrate from mobile phone to mobile computing devices (MCD) like tablet PCs before owning a full-fledged computer. Tablet PC and such Mobile computing devices (MCD) offer mobility as well as power to program application on it. However, tablet PCs come with limited peripherals because adding peripherals
20 would add to the weight, power-requirement, and other internal resources, thereby making the mobility ineffective. Having said this, a peripheral device in form of docking station with specific functionality will help many users to use MCD in their work or home.

25 **OBJECT OF INVENTION:-**

It is an object of invention to provide a docking system is a multi-functional peripheral device to Mobile Computing Device (MCD) which adds specific functionality to MCD.

30 It is another object of invention to provide docking system to make MCD as point of sale machine.

It is also another object of invention to provide docking system to make MCD as transaction device.

It is also another object of invention to provide docking system to make MCD as payment device.

It is also object of the present invention to provide docking system to make entertainment device with TV and FM radio facility.

It is also another object of invention to provide docking system to make MCD as RFID reader.

- 5 It also objects of invention to provide a docking system to connect MCD to the internet.

It is also another object of invention to provide docking system to facilitate battery charging of MCD.

10 **STATEMENT OF INVENTION:-**

Accordingly invention provides a Docking system to Mobile Computing Devices adding function of transaction, shopping, Point of Sale (POS) machine, entertainment and networking to mobile device comprises a casing body having
15 circuit board mounted thereon an Ethernet card, barcode scanner module, TV and FM tuner, magnetic strip reader module, RFID reader module, remote control with infrared receiver module, speakers and microphone electrically connected to the USB hub; at front side of said casing body a U-shaped frame member, having gap therein identical to that of MCD size, having groove means, provided for slide ably
20 mounting a mobile computing device; a retractable docking connector means provided for connecting to port of said MCD; a swiping slot provided on the one side of said frame electrically connected to the said bar code scanner module; external sockets provided on the said casing body for USB interface, AV in for digital TV, head phone interface, analogue TV input and Ethernet connection; a power pack
25 with battery backup controlled by a switch provided for power supply to circuit board.

DRAWINGS:-

The invention is described with reference to the accompanying drawing wherein:

- 30 Figure 1 shows front side prospective view of docking system with MCD mounted in the frame;

Figure 2 shows rear side prospective view of docking system with MCD mounted in the frame;

Figure 3 shows block diagram of docking system showing detailed components;

Figure 4 shows various application of docking system for mobile computing device.

DESCRIPTION:-

5 Referring to figures 1 and 2 docking system comprises a casing body having circuit board. On the said circuit board, an Ethernet card, barcode scanner module, TV and FM tuner, magnetic strip reader module, RFID reader module, remote control with infrared receiver module, speakers and microphone mounted and electrically connected to the USB hub. At front side of said casing body a U-shaped frame
10 member having the gap identical to the size of mobile computing device. The said U-shape frame members having groove means provided for slide ably mounting the said mobile computing device. The retractable docking connector means provided for connecting to port of said MCD. A swiping slot provided on the one side of said frame electrically connected to the said bar code scanner module. The external
15 sockets provided on the said casing body for USB interface, AV in for digital TV, head phone interface, analogue TV input and Ethernet connection. A power pack with battery backup controlled by a switch provided for power supply to circuit board.

The said U-frame attached to the casing body hinge means so that adjustable to
20 make slanting to the horizontal. It may be kept on desktop or mounted on wall

. The components marked in the said figures are as follows –

1. Standard Mobile Computing Device (MCD)
2. Barcode Scanner
3. Speakers
- 25 4. Magnetic Card Reader
5. USB Interface
6. AV In for digital TV
7. Headphone Interface
8. Analogue TV input
- 30 9. RJ 45 for Ethernet cable

The figure 3 shows Internal Components & Connectivity with Mobile Computing Device (MCD)

The docking stations houses barcode scanner, magnetic stripe card reader, TV & FM tuner circuit, ethernet card & usb speakers. All these assemblies has USB interface for communication with other devices.

- 5 All these components are connected to usb hub in the docking station as shown in the fig.03. On other end of this usb hub, there is a retractable usb cable which gets connected to the standard mobile computing device as shown in the fig.03.

This peripheral device would enable following functions on Mobile Computing
10 Device-

- Shopping
- Transactions
- Secure Payments
- Entertainment (TV & FM)
- 15 • Wired Connectivity For MCDs
- Sound Amplification of MCD

OPERATING PROCEDURE:-

20 First time Installation-

- User slides Mobile Computing Device into the docking station and then the user pulls the USB cable provided in the docking station and plugs the USB connector into the USB port of MCD
- Once the connection is established, the OS of the MCD searches for
25 drivers on the device.
- If the drivers are not found on the device or the OS does not search for the driver, user shall install the driver, provided along with device, on MCD

Operation-

- Once the drivers are installed, every function in device is ready for use
- 30 • Scanning Bar Code
 - The barcode scanner can be switched on by either of the following two way
 - Pressing the switch provided on the device

- On activation of proximity sensor
- Once the Barcode scanner starts emitting light, user can display the barcode in front of the source of light and waits until the barcode scanner responds by a beep indicating successful scan
- 5 ○ On successful scan, the barcode is automatically switch off

Magnetic Strip Reader-

- Reading data from magnetic strip cards like credit cards is very easy
- 10 ○ User just swipes the card in the slot provided on the device
- The data is read on swipe and fed to the reading software

TV-

- To play TV, user just needs to plug the TV cable to the connector provided on the device
- 15 ○ The type of connection and tuning is based on type of source of TV signal
- For analog TV, a co-axial cable coming from cable operator is connected to the BNC connector provided on device
- 20 ○ The TV tuning in case of analog broadcast is done thru software or thru remote control provided along with device
- For digitally transmitted signals (either thru satellite or terrestrial) the user needs to plug the cable into AV out of set top box used to decode the digital signals. The other end of the cable goes in AV In port provided in the device.
- 25 ○ The TV stations are tuned thru set top box

FM radio-

- 30 ○ The device comes with built in FM tuner as well
- The user just needs to switch on the radio and tune the station thru the driver software installed on the MCD.

LAN Connectivity-

- Should the user needs to connect the MCD to internet thru LAN cable, s/he needs to connect the LAN cable having RJ45 jack into the port provided on the device
- The settings can be set thru software driver

One additional USB is provided on the device-

- User can connect any 3rd party device like printer, portable storage devices, imaging devices, etc thru USB provided the MCD supports such device

Power Switch-

- The job of the switch is to cut off power to entire device on switching it off.
- This is useful when MCD is slid into the dock but dock is not be used.
- This saves needless wastage of power

Proximity Sensor-

- This sensor can be activated (switched on) thru driver software.
- Once the sensor is on, it send signal to the MCD whenever there is movement close to the sensor.
- Applications can use this signal to switch on Barcode scanner or switch on lights in the room

Use Case / Applications

- Domestic Application
 - The docking station couple with MCD becomes a complete transaction cum entertainment terminal for households
- As Point of Sale (POS) transaction machine
 - The docking station couple with MCD become a Point Of Sale system to be utilized by retailers, traders, and all those commercial

establishment who wishes to barcode their products or collect the payment electronically

- As Entertainment device
 - The device transforms the MCD into conventional TV or radio.
 - Users can hang this device on wall or mount on table.
 - For small shopkeepers, this works as two-in-one, POS as well TV.
- Banking and Financial Inclusion
 - Low cost & portable device can be used as a banking terminal at remote places
- Wired Connectivity
 - The LAN connectivity make easy to connect MCD to internet in absence of wireless connectivity
 - In country like India, not all have Wi-fi or mobile internet.

ADVANTAGES:-

- Functional Advantages
 - Converts any mobile computing device into fully functional transaction terminal / point of sales system & FM radio as well as television
 - Also enables MCD with the wired connectivity for data
- Economic Advantages
 - Low cost solution for POS system
 - Space saving compared to conventional PC and POS

Complete Ecosystem

This device has huge implication on small retailers who today don't have POS machine.

This device brings in the functionality of POS machine in their shop. With this machine, small retailers and traders will be able to accept payments thru cards.

Since this is an attachment to MCD, they don't need to purchase computer or learn to operate computer. Since MCDs have evolved from mobile phone, any person operating a mobile phone will be able to operate MCD. Since MCDs are programmable, SMEs will be able to run their customized software like Accounting, inventory mgmt etc. All in all, in a single cost SME derive benefit of PC, POS and mobile phone.

Retailers will be connected to distributors and manufacturers of goods and strengthen the supply chain. Retailers will be able to share market data with players in eco-system, place informed orders electronically to their principle and track goods movement transferred from principle to him.

At home, the device will useful to women to shop from the confinement of her home.

Users can scan the bar code of the product she wishes to buy and drop in the electronic shopping cart. She can pay by swiping the card on device and place order to retailer attached in the system.

The device also has huge social and environmental implication. Shopping at home will reduce traffic to supermarkets, reduce crowd in the supermarkets, put consumer directly in touch with the producer of the goods.

Producers will have better understanding of the consumer, build offerings around consumer's needs and collect feedback from consumer. Consumers will be able to connect to other consumers in real time thereby exchanging/sharing information. A better informed consumer is smart consumer who cannot be cheated easily. Businesses will not be able to fleece an informed consumer thereby reducing consumer complaints.

It is common wisdom that accessories and peripherals actually help industry of principle computing device. For example, graphical user interface and mouse found newer applications of personal computer. Similarly, this peripheral will have catalytic effect on MCD industry

Applications of invention:**1. Financial Inclusion Program**

In India, about 69% of the population is unbanked. That means, only 31% of the country's large population has bank account. The ratio of banking population is largely skewed towards urban. It is now known that while financial exclusion has direct correlation to poverty, increased financial inclusion of population into banking services has positive impact on country's economy. Therefore, Reserve Bank of India has initiated Financial Inclusion program in India with the objectives of

- Extending formal banking system among less privileged in urban & rural India
- Weaning them away from unorganized money markets and moneylenders
- Equipping them with the confidence to make informed financial decisions

Banks are allowed to appoint NGOs and not-for-profit companies as their service delivery channels or called as Banking Correspondent (BC). The BCs can in turn appoint agents villages and district level who actually facilitate banking transactions for the citizens. The primary responsibilities of agents is to facilitate following bank services

- Opening of "no-frills" bank account
- Deposits & savings
- Remittance
- Entrepreneurship credit in the form of KCC/GCC

Now, to open the bank account, citizen needs to fulfill some basic requirements like filling up form, submit photographs and provide thumb impressions (in lieu of signature). Considering the massive scale of this operation, the only way to do this through electronic channel. But one cannot find PCs and PC literate agents in rural. Rural pose other challenges as well like absence of power, absence of internet connectivity etc. Thus, companies developed solutions on mobile phone whereby the entire form would be filled on mobile by entering the data in mobile, photographs are captured through mobile's camera and finger print impressions taken on specially attached finger print scanner. While this solution is a make shift arrangement over

PC, it does not make the life of agent much easy. The small screen of mobile, cramped keyboard and limited programming potential of mobile phone are some of the challenges.

5 With Tablet PCs becoming cheaper and popular, our docking station has evinced lots of favourable response from banks and their BCs. The docking station, fully equipped with Barcode scanner, Magnetic card reader etc becomes a perfect tool for agents to facilitate transaction in rural. Large screens with programming support in regional language that Tablet PCs offer helps citizen to see/read on big screen
10 before enabling their transaction. A spare USB port help to connect any additional peripheral like printer. The built-in finger print scanner helps to secure the transaction. Apart from facilitating transactions, banks can use this device to train the agents by broadcasting document, study material and videos. All in all, this gadget becomes one of the key contributors in building the future of the nation.

15

2. Insurance Advisors & Agents

Insurance is one of life's necessities and probably the least-understood financial product. Insurance reimburses people for covered losses in the event of an unfortunate occurrence such as an illness, accident, or death. At the same time, it
20 can encourage prevention and safety measures, provide investment capital, lend money, and help to reduce anxiety for society at large.

As a mechanism against loss of income and a means of safeguarding assets, many Indians have started to buy insurance in one form or another. These coverage's may
25 include life insurance, disability insurance, a medical insurance or personal insurance to protect property such as homes, cars, computers against fire, theft or natural calamities

Insurance advisors or agents as they are popularly called, play a key role in helping
30 you to compare various products offered by the insurance company, select the right product for you based on various parameters and your requirement, fill up the lengthy forms, submit supporting documents, collect first premium and deposit with insurance company. Moreover, the agent's job has a large amount of inherent financial planning work, even if the agent does not explicitly engage in a financial

planning sideline. Thus, while success is highly dependent on sales ability, strong analytic skills are also vital. The responsibility does not stop there. The agent ensures that you pay the premiums regularly and keep the policy protected from being lapsed.

5

Traditional way and most difficult way to pay insurance premium is to visit your nearest branch with cash / cheque, stand in queue, deposit the cheque and get the receipt. Sometimes, the agent before you, will take more than 30 minutes to deposit premium for some of his customers. There are many other problems like lunch time
10 off, printer problem, internet problem, etc. The problem magnifies as you get away from cities to smaller towns and still further in rurals.

Most insurance companies have established various channels to collect premiums but all these channels are based one assumption – You, as their customer, will go
15 and pay on your own. This never happens in most cases. Most people still depend on agent to come collect their premiums. Perhaps it gives them satisfaction of making somebody responsible for money being paid.

The device combined with a Tablet PC (MCD) becomes a lethal weapon for today's
20 insurance advisor or agent. While any standard tablet PC helps the agent to carry all the details of hundreds of products offered by insurance company, makes calculations, draw comparison in real time and do financial planning, the docking station attachment helps him to facilitate payments and transactions. The barcode scanner helps scan and read payment intimation document received from insurance
25 company. Agents can now collect premium through cards or net banking by swiping the card in the magnetic card reader built-into the docking station and issue a temporary receipt immediately to their clients by attaching a portable printer on USB port provided on the docking station.

30 **3. Home POS for Home Shopping**

Retail Sector in India was being hailed as Sunshine sector just a few years back – Many Indian players entered it to grab potentially huge retail Indian consumer market and grew very aggressively. Touted as the new modern day industry in the country,

India has been ranked as the **most attractive destination for retail investment** among 30 emerging markets.

But it seems that sun is not shining on them anymore – the calculations seem to have gone wrong. The ride for this rapidly growing industry does not come without its share of topsy-turvy turbulences.

There are various challenges being faced by the organized retail sector in India, which are creating hurdles for the industry in reaching its full potential. Some of the concerns are

- lack of retail space in the eyes of escalating real-estate prices,
- shortage of trained manpower,
- shrinkage or fraud in retail and
- most of all, funding constraints and regulatory hurdles.

The sector has already witnessed a few victims who have shut their business or have downsized their operations.

The scene is no different for consumers. The initial euphoria or so-called “experience” is fast wading away. What was a “lifestyle” earlier has now morphed into boring and mundane shopping. Ever-increasing traffic, jostling for parking space, wading thru over-crowded narrow aisles of the store and finally dragging in long queues for check-out is proving deterrent for consumers. Consumers would rather spend their weekend hours in doing something more worthwhile.

According to one of the organized retailers we personally met, the business from delivery has grown from 1% to 7% in last couple of years and is expected to grow to 15% in next couple of years. The trend obviously indicates that the consumer are keeping themselves away from store, preferring convenience of shopping from the comforts of their home.

What is required is a solution that enables retailers to address their challenges as well as provide utmost convenience to consumers.

This gadget is the solution to consumer's problems. Consumers can now hook the gadget on Kitchen wall. They just need to scan the barcode on the product, which they wish to reorder. Once they have filled the shopping cart, they can actually check
5 out from the virtual store by swiping their card on the gadget and making their payment. The order is then send electronically to nearest grocery store for delivery. It is like having integrated POS terminal of retail supermarket extended to your home!

WE CLAIM:-

1. A Docking system to Mobile Computing Devices adding function of transaction, shopping, Point of Sale (POS) machine, entertainment and networking to mobile
5 device comprises a casing body having circuit board mounted thereon an Ethernet card, barcode scanner module, TV and FM tuner, magnetic strip reader module, RFID reader module, remote control with infrared receiver module , speakers and microphone electrically connected to the USB hub; at front side of said casing body a U-shaped frame member, having gap therein identical to that
10 of MCD size, having groove means, provided forslide ably mounting a mobile computing device; a docking connector means provided for connecting to port of said MCD;a swiping slot provided on the one side of said frame electrically connected to the said bar code scanner module; external sockets provided on the said casing body for USB interface, AVin for digital TV, head phone interface,
15 analogue TV input and Ethernet connection; a power pack with battery backup controlled by a switch provided for power supply to circuit board.
2. A Docking system as claimed in claim 1 wherein the said USB hub provided with one more USB port.
20
3. A docking system as claimed in claim 1 wherein the said mobile computing device is mobile touch screen hand set.
4. A docking system as claimed in claim 1 wherein the said mobile computing
25 device is a tablet PC.
5. A docking system as claimed in claims 1 to 4 wherein the said mobile computing device is powered by its own operating system.
- 30 6. A docking system as claimed in claims 1 to 5 wherein the said docking connector means comprises a docking connectors on device connects to docking port on the MCD.

7. A docking system as claimed in claims 1 to 6 wherein the said the said docking connector means comprises a retractable USB cable housed inside the device can be pulled out and connected to USB port of MCD.
- 5 8. A docking system as claimed claims 1 to 7 wherein a memory with device drivers provided on the said circuit board for installing on the MCD to make ready for functions.
9. A docking system as claimed in claims 1 to 8 wherein a bar code scanner switch
10 or /and proximity switch provided to activate bar code scanner.
10. A docking system as claimed in claims 1 to 9 wherein the said U-frame adjustable to make slanting to the horizontal.

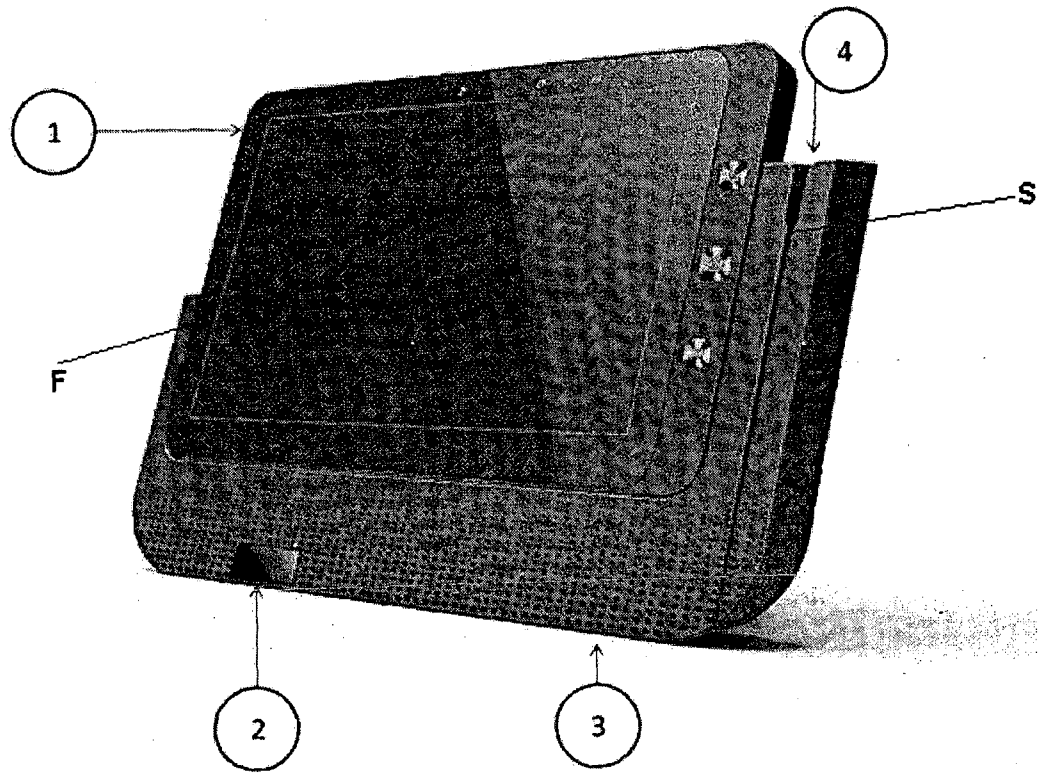


FIGURE 1

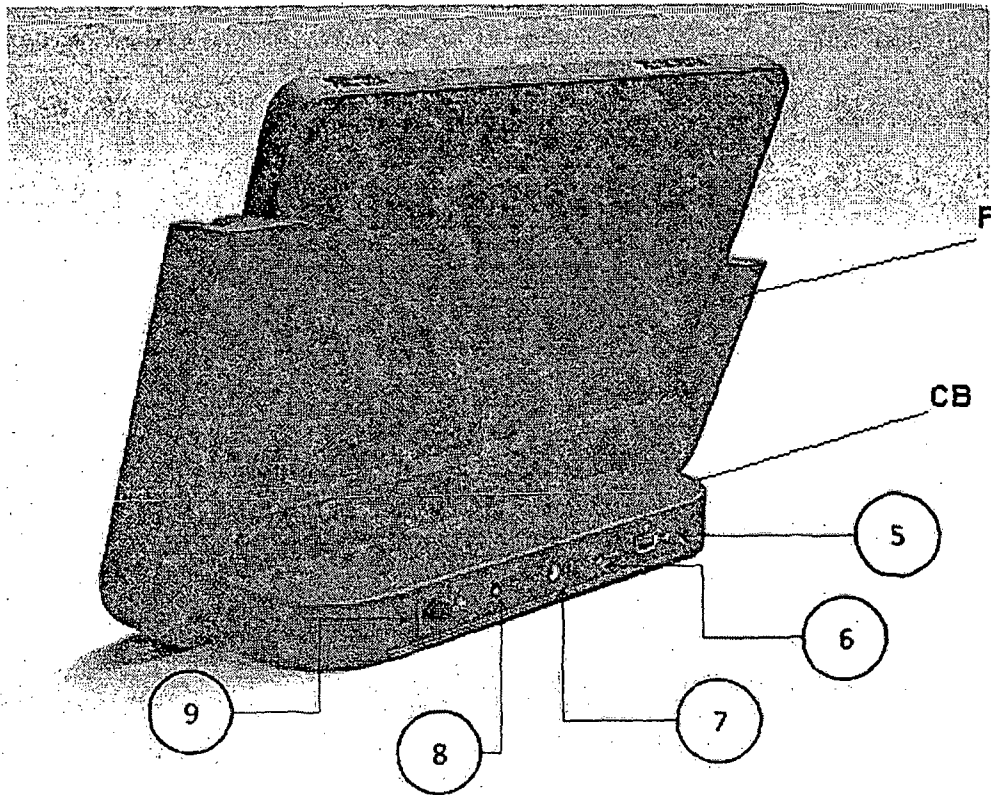


FIGURE 2

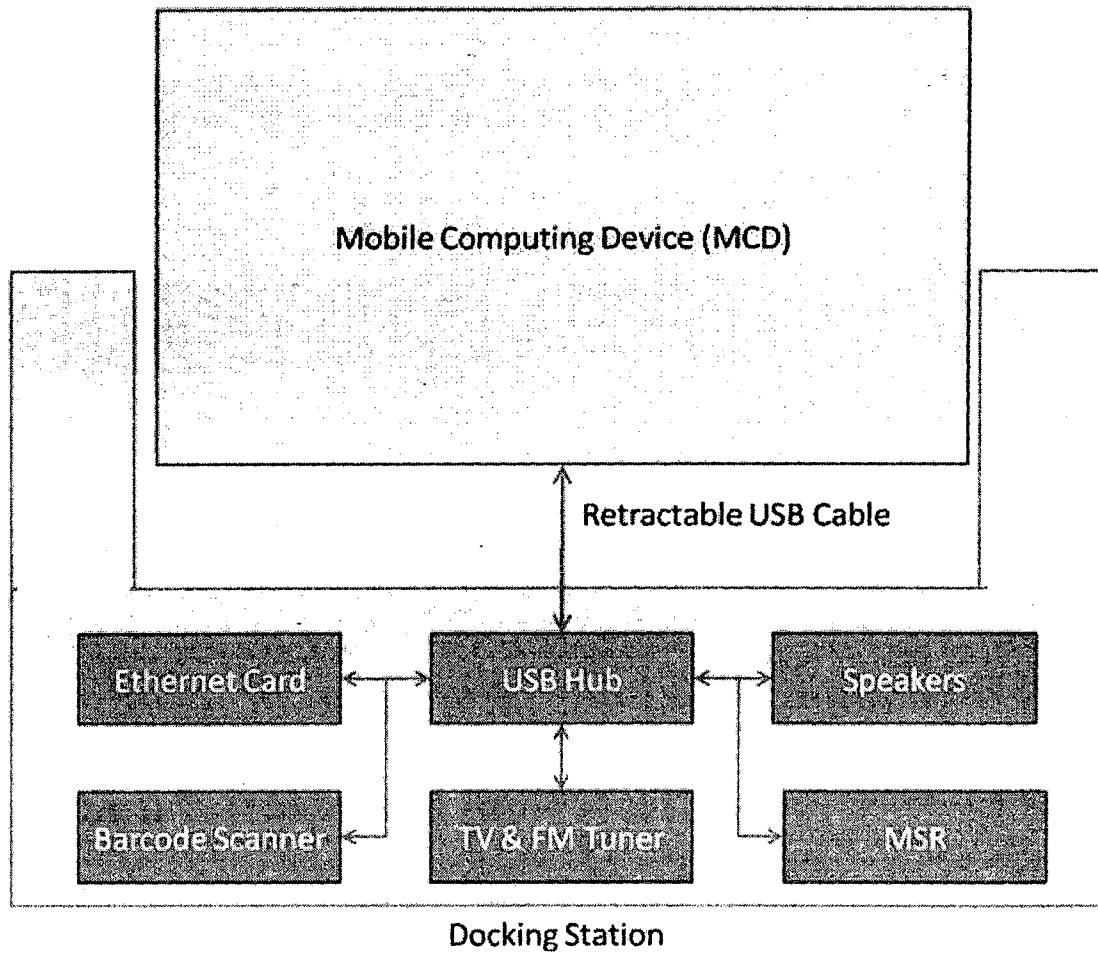


FIGURE 3

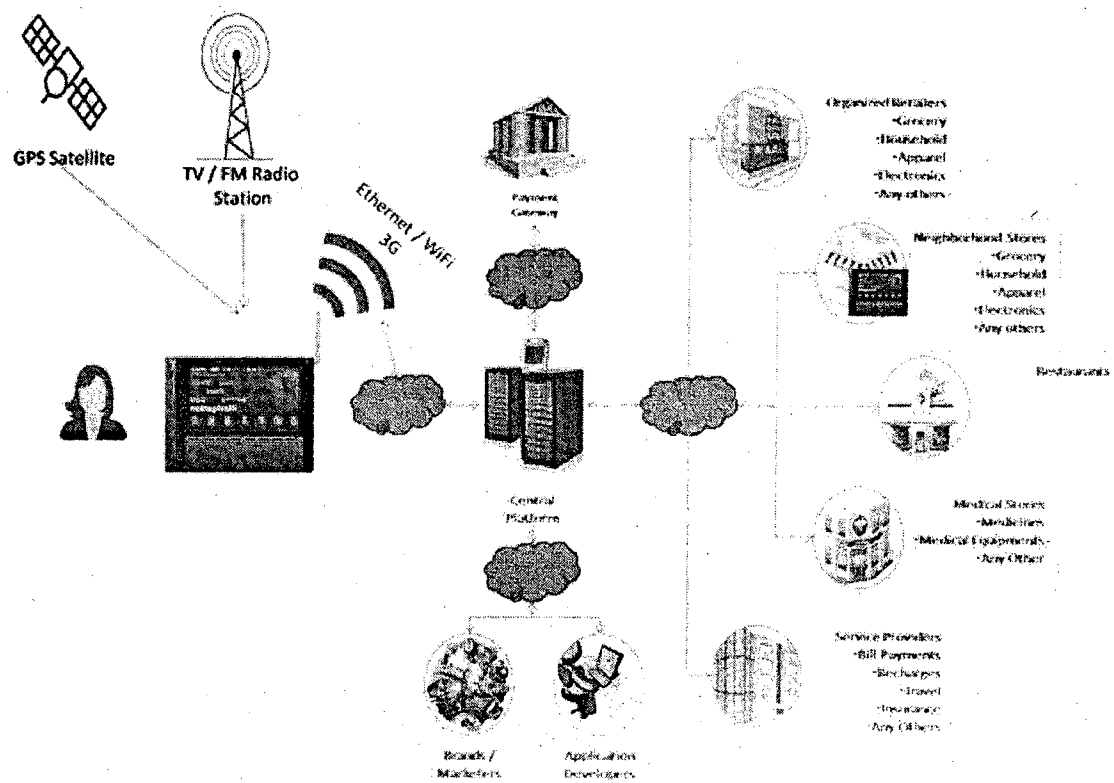


FIGURE 4