

**CONNECTOR WITH DIRECT OR INDIRECT INSERTION OF
A SMART CARD THEREIN**

The present invention relates to a connector adapted to be plugged into an electronic housing, such as a PCMCIA modem of a computer.

5 The prior art is represented by the document
FR-A-2.735.251 which provides cards of the PCMCIA type,
insertable into a PCMCIA slot of a microcomputer. To use such
a card in connection with a smart card with exposed contacts,
when the microcomputer has no reader for smart cards with
exposed contacts, the insertable card can be modified such
10 that it can receive a smart card. The insertable card can
process an insertion slot for the smart card. This slot is
formed between an upper plate and a lower plate, substantially
the same length as the upper plate and spaced by a distance
substantially equal to the thickness of a card with exposed
15 contacts; one of the plates is rigid and the other is consti-
tuted at least in part by a flexible or semi-rigid tongue on
the insertion side of the smart card. The insertion is easy
and the smart card is securely held in place.

20 This document describes the possibility of modifying
a microcomputer such that it can receive a PCMCIA card which
itself receives a smart card. In this embodiment, the smart
card is completely inserted into the PCMCIA card, there is

thus the need to provide ejection means, because the access to the smart card is not easy.

Moreover, if the card of PCMCIA format does not have a recess, it will be impossible to use a smart card, which gives rise to totally insufficient functionality of said PCMCIA card.

The document EP-A-0 696 010 has for its object a portable interface with one or several electronic smart cards, the interface being insertable into a card reader, comprised by a module, adapted to be disposed in the card reader and comprising at one end electrical connection means that can be plugged into the card reader, a ferrule secured to the other end of the module comprising a slot to introduce the smart card, a recess adapted to receive at least partially the smart card and passing through at least in part said ferrule, said recess comprising means for guiding and positioning the smart card, and means for electrical connection with the electrical contact regions of the smart card.

According to this invention, the smart card can be disposed partially within the card reader.

Nevertheless, and this is also true for the preceding document, the reader is in part constituted by the computer; because of this, the data on the smart card will be transmitted into the computer and will be easy to pirate.

Another drawback resides in the fact that the card reader extends substantially beyond the side of the computer, without which it would be impossible to withdraw this portion

outside the central unit. This is troublesome and during manipulation there can be damage to the electronic material.

To avoid these problems, the present invention relates to an external connector to the computer, into which it may be plugged, which comprises at least one space for the emplacement and reading of at least one smart card.

This technique can facilitate obtaining acceptance of the electronic material, this acceptance being carried out country-by-country when the reader is implanted in a computer.

To this end, the invention relates to a connector adapted to be plugged into an electronic housing, such as a PCMCIA modem, of a computer, characterized by the fact that the connector comprises at least one recess, each recess permitting the insertion of a smart card.

According to a first embodiment, the connector is assigned to the connection of a telephone line adapted to be plugged into an electronic housing, such as a PCMCIA modem of a computer, the connector comprising two data transmission busses, one of the busses being assigned to the interface between the telephonic line and the electronic housing, characterized by the fact that the connector comprises a recess, for the insertion of a smart card, and an interface device between the smart card and said housing, which uses the free bus, assigned to the input/output interface and connected to an interface of the smart card integrated with said connector.

The dimensions of the recess of the connector permit only a partial insertion of the smart card, such that a portion of said smart card, external to the connector, remains accessible.

5 The connector comprises at least one identification system.

 The connector comprises a display and/or a keyboard.

 The invention also relates to a connector for a telephone line adapted to be plugged into an electronic housing, such as a PCMCIA modem of a computer, the connector comprising two data transmission busses, one of the busses being assigned to the interface between the telephonic line and the electronic housing, characterized by the fact that the connector comprises a recess, for the insertion of an intermediate element which itself comprises a recess, for the insertion of a smart card, and an interface device between the smart card and said housing, via the intermediate element, which uses the free bus, assigned to the input/output interface and connected to an interface of the smart card integrated with said connector.

 The dimensions of the recess of the connector or of the intermediate element permit only a partial insertion of said intermediate element or of the smart card, such that a portion of the element or of said card, external to said connector or to said element, remains accessible.

 The portion of the intermediate element, outside the connector, comprises a keyboard.

The portion of the intermediate element, external to the connector, comprises a display.

According to a second embodiment, the connector comprises two recesses, the dimensions of each recess of the connector permitting only the partial insertion of each smart card, such that a portion of said smart card, external to said connector, remains accessible.

According to a first modified embodiment, the two recesses are located in two parallel planes, each plane being parallel to the plane formed by the electronic housing.

According to a second modified embodiment, the two recesses are located in two parallel planes, each plane being in an oblique position relative to the plane formed by the electronic housing.

According to a third modified embodiment, the two recesses are located in two planes oblique relative to each other, one of the planes being parallel to the plane formed by the electronic housing, the other plane being in an oblique position relative to the plane formed by said electronic housing.

In the case of two recesses located in parallel planes, the insertions of the two cards into the two recesses takes place perpendicularly.

Again in the case of two recesses located in parallel planes, the insertions of the two cards into the two recesses takes place in identical directions.

In the same case as above, the insertions of the two cards into the two recesses takes place in opposite directions.

5 The connector comprises a keyboard movable in rotation to adapt to the position of the person who uses the keyboard.

At least one of the recesses comprises blocking means for the position of the smart card inserted into its recess.

10 No matter what the embodiment of the connector, the portion of the smart card, external to the connector or to the intermediate element, comprises a keyboard.

The accompanying drawings are given by way of indicative and non-limiting examples. They show several preferred embodiments according to the invention. They will permit easy comprehension of the invention.

Figure 1 shows a general view of a first embodiment of the invention before insertion.

20 Figure 2 shows a general view of a second embodiment of the invention.

Figure 3 shows a general view of a third embodiment of the invention.

Figure 4 shows a view identical to that of Figure 1 of the assembly of the connector after insertion.

25 Figure 5 shows a view in cross-section on the line A-A of Figure 4.

Figure 6 shows a general view of a fourth embodiment of the invention before its insertions.

Figure 7 shows a view identical to Figure 6 after the insertions.

5 Figure 8 shows a view of the assembly of a microcomputer provided with a PCMCIA reader before its co-action with a connector with two smart cards according to a first embodiment of the invention.

10 Figure 9 shows an assembly view of a microcomputer provided with a PCMCIA reader after its cooperation with a connector with two smart cards according to the invention.

Figure 10 is a longitudinal cross-sectional view of a connector shown in Figures 8 and 9 in the absence of the two smart cards.

15 Figure 11 is a view identical to Figure 10 just after the introduction of the two smart cards.

Figure 12 shows a second embodiment of the present invention according to a first modified construction.

20 Figure 13 shows a second embodiment of the invention of the second mode of construction.

Figure 14 is a view identical to Figure 12, the connector carrying a keyboard.

Figure 15 is a view identical to Figure 13, the connector carrying a keyboard.

25 Figure 16 is identical to Figure 14, but the two smart cards have been withdrawn.

Figure 17 is identical to Figure 15, but the two smart cards have been withdrawn.

Figure 18 shows a modified construction of Figures 15 and 17, when the keyboard is subject to a rotation in a counterclockwise direction.

Figure 19 shows a view identical to Figure 18, when the keyboard has undergone a rotation in a clockwise direction.

Figure 20 is a side view of a final embodiment of the invention, of a connector when the two reception recesses for the smart cards, empty in the present case, are parallel to each other.

Finally, Figure 21 shows a view identical to Figure 20, in which one of the recesses has been rotated such that the two recesses form an angle.

At present, a modem is comprised by the following elements:

There is first of all the electronic housing which is connected by one of its ends to a telephone line and by the other end to the computer via a wire connection.

In the case of a PCMCIA modem, there is therefore an electronic housing which comprises a PCMCIA interface with the computer and two interfaces with the telephone line, the one associated with the telephone line itself and the other the input/output that is generally not used.

The object of the invention consists, according to a first embodiment shown in Figures 1 to 7, in using the

input/output interface for connecting it to an interface device with a smart card integrated into the securement connector.

Because of this, the connector 1 of a telephone line 2 is adapted to be plugged into an electronic housing 3 in the direction F2.

On the other side of line 2, a telephone jack 15 permits the connection to a conventional telephone network.

Such an electronic housing can be constituted by a PCMCIA modem 3 of a microcomputer 13.

The connector 1 comprises two data transmission busses 4 and 5 which are altogether conventional, one of the busses 5 being assigned to the interface between the telephone line 2 and the electronic housing 3.

In the embodiment of the present invention, the second bus 4 remains free and is in fact associated with the connection to an interface with a smart card integrated into said connector 1.

To do this, the connector 1 comprises a recess 6 for the insertion of a smart card 7 with electrical contact areas 12. Of course, because of the size of the connector 1, the dimensions of the recess 6 of the connector 1 permit only a partial insertion of the smart card 7 in the direction of arrow F1 such that a fairly large portion, which is to say at least half of the smart card 7, is outside the recess 6 when the card is completely introduced into said recess 6, the portion which is not within the recess 6 remaining accessible

to the user whether to withdraw it or to carry out manipulations that can be envisaged, for example in the case the card 7 can comprise, on its more visible surface, a keyboard 10, as is shown in Figure 2, or the connector can have a keyboard 14, as is shown in Figure 3.

If desired, instead of or in addition to the keyboard, there can be a system for vocal recognition or fingerprinting or any other identification system, the whole being associated or not with a display 11.

Of course, it can also be provided that this recognition device (keyboard, vocal recognition, display, etc.) will be mounted directly on the connector 1 itself, as is shown in Figure 3.

According to another embodiment shown in Figures 6 and 7, the connector 1 is exactly identical to that which has been described.

Nevertheless, the recess 6 permits the introduction of an intermediate element 8, which itself comprises a recess 9 for the insertion in the direction of the arrow F3 of a smart card 7 as defined above.

Of course, the recess 6 again permits the introduction of a smart card, as shown and described above.

It is therefore the intermediate element 8 which will be inserted in the direction of arrow F4 into the connector 1 and will use the free bus 4 assigned to the input/output interface and which in this case will be connected to a smart card interface integrated with said connector 1.

Of course, in the same way, the dimensions of the recess 9 of the intermediate element 8 permit only the partial insertion of the smart card 7.

5 Similarly, the dimensions of the recess 6 of the connector 1 permit only a partial insertion of said intermediate element 8 or of the smart card 7, such that a portion of the card 7 or of the element 8 remains outside said connector 1 or the element 8.

10 Of course, in the same way as for the preceding embodiment, it will be possible to provide recognition systems such as the keyboard 16, vocal recognition, display at the level of the connector 1, of the smart card 7 but also at the level of the intermediate element 8.

15 According to Figures 8 to 19, several modifications of construction of a second embodiment of the invention are shown.

In this embodiment, the connector is again designated 21 no matter what its form.

20 This connector 21 coacts, as is shown in Figures 8 and 9, with an electronic housing 3 which is constituted, over all the figures, by a PCMCIA modem.

25 This PCMCIA modem 3 is incorporated in a microcomputer 13. It is not necessary, as shown in the drawings, that it have elements which are external to the central unit of the microcomputer 13.

Nevertheless, to understand the connection, an element external to the central unit has been shown generally.

This connection is made by insertion in the direction of the arrow F of the connector 21 into the microcomputer 13. The connection takes place at the level of the bus 23 of the connector 21.

5 In Figures 10 and 11, the connector 21 is better shown in longitudinal cross-section.

It will be noted that there are two recesses 24 and 26 which permit the insertion of two smart cards 25 and 27.

10 According to this modification, the two recesses 24 and 26 are in oblique position relative to each other, which is to say that there is an angle α which is substantially 35° , in Figure 10, this angle α existing between the plane passing through the first recess 24 and the plane passing through the second recess 26.

15 The first plane is in fact in the same plane as the electronic housing 3 or 22. The second plane is itself positioned obliquely. Moreover, there are several wire connections 29 within the connector 22.

20 This is not at all the case of the embodiment of the connector 21 in Figures 12 to 19, because in this case, the planes of the two recesses 24 and 26 are in parallel positions relative to each other.

25 According to Figure 12, the two cards 25 and 27 are inserted perpendicularly relative to each other, one of the cards 25 being inserted along the same axis as the insertion in the direction of the arrow F5 of the connector 21 and the microcomputer 13. Of course, the other card is perpendicular.

According to Figure 13, the two cards 25 and 27 are inserted in opposite directions. The two cards 25 and 26 are thus perpendicular in their insertion, to the insertion along the arrow F5, seen previously.

5 The embodiments of Figures 12 and 13 are like those of Figures 14 and 15.

Nevertheless, there is an important difference. At the level of the connector 21, is present a keyboard 28. This keyboard 28 is also shown in Figures 16 to 19.

10 Nevertheless, in Figures 18 and 19, another function of the keyboard 28 is shown.

According to Figure 18, it is possible to actuate the keyboard 28 with a movement of rotation in counterclockwise direction, in the direction of the arrow F6.

15 In Figure 19, the rotation of the keyboard 28 takes place in the clockwise direction, in the direction of arrow F7.

20 Thus, one of the principal interests of this type of connector 21 with a rotatably movable keyboard 28, is the use of said connector 21 with a computer which may be portable or not, of a doctor.

Thus, it will be possible in future years, to the doctor, to insert his personal card so as to start the computer on the task to be accomplished.

25 Then, as a function of the patient he encounters, who will have the same card, it will be possible to insert the card of the patient at the level of one of the two recesses

remaining open. The keyboard 28 is moved in rotation, either in the direction F6, or in the direction F7, according to the implantation side of the connector 21 on the electronic housing or modem PCMCIA 3. Thus the doctor or the patient
5 could type in his confidential code whilst having the numerals facing him.

Of course, the present invention relates also to a connector combining the characteristics of the first and second embodiments, which is to say corresponding to Figures
10 1 to 7, on the one hand, and 8 to 19, on the other hand.

According to Figures 20 and 21, the two recesses 24 and 26, adapted to receive smart cards 25 and 27, have another shape. They constitute two physically independent elements 24 and 26 separated from each other by a pivotal axis 30. By
15 pivoting the recess 26 in the direction of arrow F8, it is possible to vary infinitely the position of the two recesses 24 and 26, there is thus an infinity of values for α in this embodiment.

REFERENCES

1. Connector
2. Telephone line
3. Electronic housing or PCMCIA modem
- 5 4. Bus assigned to the input/output interface
5. Bus assigned to the interface between the line 2 and the housing 3
6. Recess of the connector 1
7. Smart card
- 10 8. Intermediate element
9. Recess of element 8
10. Keyboard of the card
11. Display of the card 7
12. Areas of electrical contact
- 15 13. Microcomputer
14. Keyboard of the connector
15. Telephone jack
16. Keyboard of the element 8
21. Connector
- 20 23. Bus of the connector 21
24. First recess
25. First smart card coacting with the recess 24
26. Second recess
27. Second smart card coacting with the recess 26
- 25 28. Movable rotatable keyboard
29. Wire connection within the connector 21
30. Axis of articulation between the two recesses 24 and 26

- α . Angle between the planes formed by the recesses 24 and 26
- 5 F1. Insertion of the card 7 in the connector 1
- F2. Insertion of the connector 1 in the microcomputer 13
- F3. Insertion of the card 7 in the element 8
- F4. Insertion of the element 8 in the housing 3
- F5. Insertion of the connector 21 in the microcomputer 13
- F6. Rotation of the keyboard 28 in the clockwise direction
- F7. Rotation of the keyboard in the counterclockwise direction
- 10 F8. Rotation of one of the two recesses 26 relative to the axis 30



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CLAIMS

1. Connector (1 or 21) adapted to be plugged into an electronic housing (3 or 22), such as a PCMCIA modem (3 or 22) of a computer (13), characterized by the fact

that the connector (1 or 21) comprises at least one recess (6, 24 and/or 26), each recess (6, 24 or 26) permitting the insertion of a smart card (7, 25 or 27).

2. Connector (1), according to claim 1, for a telephone line (2) adapted to be plugged into an electronic housing (3), such as a PCMCIA modem (3) of a computer, the connector (1) comprising two data transmission buses (4 and 5), one of the buses (5) being assigned to the interface between the telephone line (2) and the electronic housing (3), characterized by the fact

that the connector (1) comprises a recess (6), for the insertion of a smart card (7), and an interface device between the smart card (7) and said housing (3), which uses the free bus (4), assigned to the input/output interface and connected to an interface of the smart card integrated with said connector (1).



3. Connector, according to any one of claims 1 or 2, characterized by the fact

that the dimensions of the recess (6) of the connector (1) permit only a partial insertion of the smart card (7), such that a portion of said smart card (7), external to said connector, remains accessible.

4. Connector, according to any one of claims 1 to 3, characterized by the fact

that the connector comprises at least one identification system.

5. Connector, according to any one of claims 1 to 4, characterized by the fact

that the connector comprises a display and/or a keyboard.

6. Connector (1), according to claim 1, for a telephone line (2) adapted to be plugged into an electronic housing (30), such as a PCMCIA modem (3) of a computer, the connector (1) comprising two data transmission buses (4 and 5), one of the buses (5) being assigned to the interface between the telephone line (2) and the electronic housing (3), characterized by the fact

that the connector (1) comprises a recess (6), for the insertion of an intermediate element (8) which itself comprises a recess (9), for the insertion of a smart card (7), and an interface device between the smart card (7) and said housing (3), via the intermediate element (8), which uses the





free bus (4), assigned to the input/output interface and connected to an interface of a smart card integrated with said connector (1).

7. Connector, according to any one of claims 1 to 6, characterized by the fact

that the dimensions of the recess (6 or 9) of the connector (1) or of the intermediate element (8) permit only a partial insertion of said intermediate element (8) or of the smart card (7), such that a portion of the element (8) or of said card (7), external to said connector (1) or to said element (8), remains accessible.

8. Connector according to any one of claims 1, 6 or 7, characterized by the fact

that the portion of the intermediate element (8), external to the connector (1), comprises a keyboard (10).

9. Connector, according to any one of claims 1, 6 to 8, characterized by the fact

that the portion of the intermediate element (8), external to the connector (1), comprises a display (11).

10. Connector, according to claim 1, which comprises two recesses (24 or 26), characterized by the fact

that the dimensions of each recess (24 or 26) of the connector (21) permit only a partial insertion of each smart card (25 or 27), such that a portion of said smart card (25 or 27), external to said connector (21), remains accessible.





11. Connector, according to any one of claims 1 or 10, characterized by the fact

that the two recesses (24 and 26) are located in two parallel planes, each plane being parallel to the plane formed by the electronic housing (22).

12. Connector, according to any one of claims 1 or 10, characterized by the fact

that the two recesses are located in two parallel planes, each plane being in an oblique position relative to the plane formed by the electronic housing.

13. Connector, according to any one of claims 1 or 10, characterized by the fact

that the two recesses (24 and 26) are located in two planes oblique relative to each other, one of the planes being parallel to the plane formed by the electronic housing (22), the other plane being in an oblique position relative to the plane formed by said electronic housing (22).

14. Connector, according to any one of claims 11 or 12, characterized by the fact

that the insertions of the two cards (25 and 27) into the two recesses (24 and 26) takes place perpendicularly.

15. Connector, according to any one of claims 11 or 12, characterized by the fact

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that the insertions of the two cards (25 and 27) into the two recesses (24 and 26) takes place in identical directions.

16. Connector, according to any one of claims 11 or 12, characterized by the fact

that the insertions of the two cards (25 and 27) into the two recesses (24 and 26) takes place in opposition directions.

17. Connector, according to any one of claims 1 or 10 to 16, characterized by the fact

that the connector (21) comprises a rotatably movable keyboard (28) to adapt to the position of the person who uses the keyboard (28).

18. Connector, according to any one of claims 1 or 10 to 17, characterized by the fact

that at least one of the recesses (24 and/or 26) comprises a means for blocking in position the smart card (25 or 27) inserted into its recess (24 or 26).

19. Connector, according to any one of claims 3, 7 or 10, characterized by the fact

that the portion of the smart card, external to the connector or to the intermediate element, comprises a keyboard.

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