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Television apparatus with a flat display screen

The present invention concerns a television apparatus with a flat display screen, for example with a plasma or TFT (Thin Film Transistor) display screen, in particular a flat television apparatus that is destined for
5 being mounted onto a wall.

Flat screens used among others in computers and television apparatus are already known. In particular plasma display-screens are often used for television apparatus since it is possible with this technology to produce also very large screens, among others screens with a diagonal
10 measurement of over 50 cm. Such large screens are very popular among others as home television apparatus.

Many consumers wish to be able not only to receive current programs but also to reproduce animated image sequences recorded on storage disks, for example on DVDs (Digital Versatile Disks), on their
15 television apparatus. For this purpose, it is generally necessary to acquire a separate apparatus with a DVD drive that is connected over a special cable with the television apparatus. This solution however proves expensive and has a high space requirement since two different apparatus with two housings and two power supply units must be provided. Furthermore,
20 problems arise regarding the design which are difficult to solve; in particular in the case of a flat television apparatus mounted on a wall, the cable connections between the DVD drive and the television apparatus are perceived as unaesthetic.

Television apparatus with an integrated disk drive requiring no
25 external cabling are already known. The disk drive is generally horizontal and arranged perpendicularly to the screen; for example drives with a draw that can be ejected horizontally from the television front plate for inserting a disk are known.

Such disk drives are however not suitable for flat-screen
30 televisions where the depth of the apparatus is smaller than the length of



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the drive. Furthermore, the front plate of the drives currently on the market is not compatible with the color and design of modern flat-screen television apparatus. Cheap disk drives are in fact mostly conceived for PCs and accordingly are of a beige color that does not match the mostly black
5 or silver-gray flat-screen television apparatus.

Disk drives are also known in which the disk can be inserted vertically, which proves impractical. The same applies to drives in which only the cover opens: also in this case does it happen all too often that the storage disk is dropped when inserted.

10 It is therefore an aim of this invention to propose a television apparatus with a plasma display-screen that avoids these disadvantages.

According to the present invention, these aims are achieved in particular through the characteristics of the independent claims. Further advantageous embodiments are moreover described in the dependent
15 claims and in the description.

In particular, these aims of the invention are achieved in that the television apparatus, with a plasma display-screen, a TV-tuner and at least one loudspeaker in a flat housing suitable for being mounted on a wall and in which all components are accommodated, furthermore comprises a disk
20 drive for reading optical, magnetic and/or opto-magnetic storage disks, said entire disk drive being mounted on the inside of an outwards tiltable door on the front side of said housing.

This has among others the advantage that the entire disk drive is hidden behind the outwards tiltable door. Thus, it is also possible to use
25 conventional drives designed for PCs without the aesthetics of the television apparatus being spoiled.

Another advantage is that the drive can be easily replaced without having to open the entire housing of the television apparatus.

This arrangement further allows to insert the disks horizontally but to read them vertically. This has the advantage that the disks can be conveniently inserted in a drive functioning vertically.

Hereafter, preferred embodiments of the invention will be
5 described in more detail and illustrated by the attached drawings, in which:

Fig. 1 shows a perspective representation of a television apparatus with the outwards tiltable door in closed position.

Fig. 2 shows a perspective representation of a section of the television apparatus with the outwards tiltable door in open position.

10 Fig. 3 shows an exploded view of the outwards tiltable door in open position.

Figure 1 shows a perspective representation of a television apparatus 1 with a plasma flat display-screen 3 and two loudspeakers 4, 5 on both sides of the display screen 3. A frame 2, for example of steel or preferably of aluminum, serves as housing for components of the television
15 apparatus. Electronic components, not represented, for example a TV tuner, a video card, a PC motherboard with one or several extension cards, are arranged on one or several circuit boards in the housing behind and parallel to the display screen 3. The television apparatus is controlled with
20 an infrared or radio remote control and thus preferably exhibits no visible control elements. The infrared transceiver is for example placed in the lower part of the frame 2. A non-reflecting glass plate in front of the plasma display-screen 3 shields it electromagnetically.

The television apparatus has one or several disk drives that are
25 mounted on the inside of an outwards tiltable door 64. The width of the door 64 corresponds to the width of the cover in front of the loudspeaker 4 so that it can be mounted directly under this cover. The door is preferably clad with the same textile as the cover is. In order for the textile cladding in front of the door not to prevent its opening, it is preferably mounted to

the door over a sliding element so that the door covering moves parallel to the door as soon as it meets against the hinges during opening.

Figure 2 shows a section of the television apparatus 1 with the outwards tiltable door 64 in open position. Some components of this arrangement are better visible in the exploded view of Figure 3 that will be described together with Figure 2.

The door 64 is connected over a hinge 66 with the frame 2 of the television apparatus 1. The hinge 66 consists of a plate 662 inserted in the profile of the frame 2 and onto which a fixed hinge-bushing 660 is fastened with screws 661. The door 64 comprises a second hinge-bushing held through two pins or screws 663 and over two disks 664 with the first hinge-bushing 660, which allows the door to be opened and closed. In a preferred embodiment, not represented, the opening of the door is facilitated through spring means.

In the represented example, two disk drives 60, 61 are mounted over one another on the inside of the outwards tiltable door 64. The first drive 60 is in this example a usual commercially available CD or DVD drive that is fastened directly on the door through a circuit board 65. The circuit board 65 is fastened with four screws 640 to the door 64. A second usual commercially available drive 61, in this example a floppy disk drive, is mounted on the other side of the circuit board 65. Both drives are connected with the circuit board and with the electronics inside the television apparatus over flat cables 650 respectively 651 and 652; these cables also ensure the electric supply of the drives. A manufactured or cast covering plate 63 covers the two drives 60, 61 and protects them from impacts.

As can be seen in particular in Figure 2, both drives 60, 61 are in horizontal position when the door 64 is open. In this position, floppy disks respectively CDs or DVDs can be comfortably inserted. The front plate of the floppy disk drive 61 and of the DVD drive 60 are parallel to the display screen 3 in order to take advantage of the entire width of the loudspeakers 4 and can be operated without problems. When the door is closed, both

drives find themselves invisibly and space-savingly placed in vertical position in the housing. The door can be locked respectively opened with a snap device.

5 This arrangement has the additional advantage that the opening behind both drives 60, 61 is freely accessible when the door is open. In this opening, it is possible to store additional control elements for the television apparatus and/or, as in the represented example, a hard drive 63. The hard drive can be easily dismantled when the door 64 is open without having to open the entire housing 2; it is connected over additional cables 630, 631
10 with the electronics inside the housing 2. A board 632, respectively a circuit board, is mounted behind the hard drive and allows among others the electronics and the display screen to be protected from electromagnetic influences of the drives 60, 61, 63.

15 Although this description shows in particular the specific case of a television apparatus with a DVD and a floppy disk drive, the one skilled in the art will understand that other drives, for example drives for other types of magnetic, optical or opto-magnetic storage disks, can be arranged behind one or two doors on the front plate of a television apparatus. As
20 equivalent solution it would be possible within the framework of this invention to use also drives for SSD modules or chip-card readers.

Claims

1. Television apparatus (1) with the following components:
a flat display-screen (3),
at least one loudspeaker (4,5),
5 at least one disk drive (60, 61) for reading optical, magnetic
and/or opto-magnetic removable storage disks,
a TV tuner,
a flat housing (2) in which all said components are
accommodated,
10 characterized in that at least one disk (60, 61) is mounted on
the inside of an outwards tiltable door (64) on the front side of said
housing.
2. Television apparatus according to the preceding claim,
wherein the width of said door (64) is equal to the width of the covering in
15 front of said loudspeaker (4).
3. Television apparatus according to one of the preceding claims,
wherein spring means are provided for automatically opening said
outwards tiltable door (64) when it is released.
4. Television apparatus according to one of the preceding claims,
20 wherein several disk drives (60, 61) are mounted over one another on said
inside of the outwards tiltable door.
5. Television apparatus according to the preceding claim,
wherein at least one circuit board is fastened to said door, the cabling of at
least one of said drives being achieved over said circuit board.
- 25 6. Television apparatus according to one of the preceding claims,
wherein the front plate of at least one of said drives (60, 61) is mounted
perpendicularly to the axis of the hinge (66) of said door (64).

7. Television apparatus according to one of the preceding claims, wherein at least one of said disk drives consists of a DVD drive (60).

8. Television apparatus according to one of the preceding claims, wherein at least one of said disk drives consists of a floppy disk drive (61).

5 9. Television apparatus according to one of the preceding claims, wherein a hard drive (63) is mounted in the opening behind said outwards tilting door (64) and can be dismounted when said door is open.

10 10. Television apparatus according to one of the preceding claims, wherein at least one control element is mounted in the opening behind said outwards tilting door (64) and can be manipulated when said door is open.

11. Television apparatus according to one of the preceding claims, wherein at least one of said drives (60, 61) can be dismounted without having to open said housing when said door is open.

15 12. Television apparatus according to one of the preceding claims, wherein a covering is mounted in such a sliding manner to said door that it moves parallel to the door as soon as it meets against the hinge of said door (64) during opening.

20 13. Television apparatus according to one of the preceding claims, wherein said housing comprises a profiled frame around the entire television apparatus and wherein said hinge is mounted directly onto said housing.

14. Television apparatus according to one of the preceding claims, wherein said flat display screen is a plasma display-screen.

25 15. Television apparatus according to one of the claims 1 to 13, wherein said flat display screen is a TFT (Thin Film Transistor) display-screen.