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SPECIFICATION

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Optical Filter for Visual Display Terminals

TECHNICAL FIELD

The present invention relates to an optical filter for
5 visual display terminals, in more detail, a wraparound type
optical filter that comprises a frame covering not only the
front but also the sides of the visual display terminals, and a
filter proper that is provided at a predetermined position in
the frame and is nearly equal in shape to the display screen of
10 the visual display terminal.

BACKGROUND ART

Visual display terminals using CRTs (cathode ray
tubes), liquid crystals, optical fibers, LEDs, etc. have been
widely used for computers, various video apparatuses, etc., and
15 variously composed optical filters have been proposed or
presented, to be mounted onto these visual display terminals.
These visual display terminals can be roughly classified into
flat type for simply covering the front of the visual display
terminal, and the above mentioned wraparound type. In these
20 types, wraparound type is more excellent because of the
advantages that dust, etc. do not come into the clearance
between the visual display terminal and the filter and that
contrast can be improved since external light does not directly
come into the clearance between the visual display terminal and
25 the filter. Wraparound type also has a further other advantage
that since it approximates the visual display terminal in
appearance, it little gives a feeling of incompatibility when

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it is mounted.

However, since a wraparound type optical filter has its filter proper installed in a frame shaped like a relatively shallow rectangular dish, it can be well mounted onto the visual display terminal concerned, but it can happen that the filter cannot be mounted onto a different visual display terminal or that the frame is so large for the visual display terminal as to give a feeling of incompatibility. Therefore, if these undesirable happenings are to be avoided, many kinds of optical filters specially sized for many kinds of visual display terminals need be presented.

To avoid these inconveniences, a filter composed as shown in Japanese Laid-open Patent Application (Kokai) No.5-219463 (1993) is proposed. This filter has a relatively rigid frame having n sides approximating the shape and size of a visual display terminal, with a groove formed in $(n - 1)$ sides excluding the bottom side of the frame facing the visual display terminal, and has relatively flexible lip means of selected length corresponding substantially to the peripheral length of the $(n - 1)$ sides of the frame. The lip means comprises a tongue extending along the length of the lip means for mating with the frame groove to mount the lip means to the frame, and a rearwardly and inwardly extending relatively flexible concave lip that is joined to the tongue and extending along the length of the lip means to form a generally U-shaped configuration that is open along the bottom side of the frame, so that the lip means slides onto the

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visual display terminal via the open side and into mounting engagement with the sides of the visual display terminal to adapts the bezel to the size of the visual display terminal.

In the filter composed as described in said Japanese Laid-open Patent Application (Kokai) No.5-219463 (1993), since the lip means only is flexible, and the frame is not flexible, the size of the filter as a whole cannot be changed. Therefore, since the filter must be prepared to suit the shape and size of the largest visual display terminal among those intended to have the filter mounted, the filter is inevitably large. If the filter is mounted onto a small visual display terminal, the frame is remarkably larger than the shape and size of the visual display terminal, to give a feeling of incompatibility to some extent for impairing the beautiful appearance. Furthermore, depending on the kind of the visual display terminal, the screen of the visual display terminal may deviate from the filter proper in position. Moreover, since the filter is mounted onto the visual display terminal by the flexibility of the lip means, any impact, etc. is highly liable to cause the filter to fall off.

DISCLOSURE OF THE INVENTION

The present invention has been made in view of the above problems. The object of the present invention is to present an optical filter for visual display terminals, which can be mounted onto any kinds of visual display terminals without any limitation and without any feeling of incompatibility.

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An optical filter for visual display terminals of claim 1 for achieving the object comprises a frame comprising a frame proper with a predetermined depth and a front shape corresponding to the main body of the visual display terminal, 5 for holding the filter proper, and side frame members that are connected on both sides of the frame proper and capable of being horizontally adjusted in relative position against the frame proper.

With this optical filter for visual display terminals, 10 the frame holding the filter proper with a shape corresponding to, and preferably with a nearly equal size to, the screen of the visual display terminal to have the filter mounted comprises the frame proper that has a shape corresponding to the main body of the visual display terminal and has a 15 predetermined depth, and side frame members connected on both sides of the frame proper and capable of being horizontally adjusted in relative position against the frame proper. Therefore, if the side frame members are adjusted horizontally in relative position to suit the shape and size of the visual 20 display terminal to have the filter mounted, the optical filter can be mounted without giving almost any feeling of incompatibility. Since one kind of optical filters can be used for many kinds of visual display terminals, mass production of a few kinds can be achieved.

25 In an optical filter for visual display terminals of claim 2, the frame proper is open at least at the bottom.

Since the frame proper of this optical filter for

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visual display terminals is open at least at the bottom, the frame proper does not contact the visual display terminal when the filter is mounted onto the visual display terminal from above or removed from it upward, to assure very excellent
5 handling convenience.

An optical filter for visual display terminals of claim 3 is an optical filter of claim 1 or 2, which further comprises a height adjusting member provided between the top face of the main body of the visual display terminal and the
10 top face of the frame proper of the frame, for adjusting the relative position between the screen of the visual display terminal and the filter proper of the optical filter.

This optical filter for visual display terminals has additionally the height adjusting member to allow vertical
15 adjustment in relative position. Therefore, if the filter proper deviates from the screen of the visual display terminal in vertical relative position depending on the kind of the visual display terminals, the height adjusting member provided between the top face of the main body of the visual display
20 terminal and the top face of the frame can prevent the deviation in vertical relative position.

An optical filter for visual display terminals of claim 4 is an optical filter of claim 1, 2 or 3, which further comprises an engaging portion provided on the top face of the
25 frame proper of the frame, and a filter mounting means to be detachably engaged with the engaging portion, and the filter mounting means is fixed on the top of the main body of the

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visual display terminal, to keep the filter mounted onto the visual display terminal.

This optical filter for visual display terminals is mounted on the visual display terminal by means of an engaging portion provided on the top face of the frame proper of the frame and an engaging portion the filter mounting means fixed on the top of the main body of the visual display terminal, so that the optical filter is prevented from falling off by the engagement between the said engaging portions even if an impact, etc. is applied. Furthermore, since the filter mounting means is mounted at the center on the top face, the optical filter can be simply removed by lifting it upward.

An optical filter for visual display terminals of claim 5 is an optical filter of claim 1, 2 or 3, which further comprises an engaging portion provided on the side frame member of the frame, and a filter mounting means to be detachably engaged with the engaging portion, and the filter mounting means is fixed on both sides of the main body of the visual display terminal, to keep the filter mounted onto the visual display terminal.

This optical filter for visual display terminals is mounted on the visual display terminal by means of an engaging portion provided on the side frame member of the frame and an engaging portion in the filter mounting means fixed on the visual display terminal, so that the optical filter is prevented from falling off by the engagement between the said engaging portions even if an impact, etc. is applied.

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An optical filter for visual display terminals of claim 6, which comprises a filter proper with a shape corresponding to the screen of the visual display terminal to have the filter mounted, and a frame for holding the filter proper, comprising the frame which comprises a front frame with a shape corresponding to the main body of the visual display terminal, a top plate and side plates connected with the front frame tiltably at any optional positions, and corner members for connecting the top plate with the side plates.

10 With this optical filter for visual display terminals, the frame comprising the front frame with a shape corresponding to the main body of the visual display terminal, the top plate and side plates connected with the front frame tiltably at any optional positions, and corner members for
15 connecting the top plate with the side plates. Therefore, if the top plate and side plates are tilted at any optional positions to suit the shape and size of the visual display terminal to have the filter mounted, and connected by the corner members, the optical filter can be mounted onto the
20 visual display terminal without giving almost any feeling of incompatibility.

An optical filter for visual display terminals of claim 7 is an optical filter of claim 6, which further comprises an engaging portion provided on the top plate of the
25 frame, and a filter mounting means to be detachably engaged with the engaging portion, and the filter mounting means is fixed on the top of the main body of the visual display

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terminal, to keep the filter mounted onto the visual display terminal.

With the above optical filter for visual display terminals, the engaging portion is provided in the top plate of the frame, and the filter mounting means to be detachably engaged with the engaging portion is fixed on the top face of the main body of the visual display terminal, for keeping the filter mounted to the visual display terminal. Therefore, even if an impact, etc. is applied, the engagement between the engaging portion and the filter mounting means can prevent the optical filter from falling off, and the optical filter can be simply removed by lifting it upward.

An optical filter for visual display terminals of claim 8 is an optical filter of claim 6 or 7, which further comprises an engaging portion provided on the side plate of the frame, and a filter mounting means to be detachably engaged with the engaging portion, and the filter mounting means is fixed on both sides of the main body of the visual display terminal, to keep the filter mounted to the visual display terminal.

With the above optical filter for visual display terminals, the engaging portion is provided in the side plate of the frame, and the filter mounting means to be detachably engaged with the engaging portion is fixed on the side face of the main body of the visual display terminal, for keeping the filter mounted to the visual display terminal. Therefore, even if an impact, etc. is applied, the engagement between the

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engaging portion and the filter mounting means can prevent the optical filter from falling off.

BRIEF DESCRIPTION OF THE DRAWINGS

Fig. 1 is a front perspective view showing an example of the optical filter for visual display terminals of the present invention.

Fig. 2 is an upper rear perspective view showing said example of the optical filter for visual display terminals of the present invention.

Fig. 3 is an exploded perspective view showing an essential portion of an example of the optical filter for visual display terminals of the present invention.

Fig. 4 is a side view showing another essential portion of said example of the optical filter for visual display terminals of the present invention.

Fig. 5 is an exploded perspective view showing an example of the filter mounting means provided on the visual display terminal to have the optical filter of the present invention mounted.

Fig. 6 is a front perspective view showing another example of the optical filter for visual display terminals of the present invention.

In the drawings, the following numerals denote the following parts respectively.

1 : filter proper 2 : frame 3 : frame proper 4 : side frame member
5 : height adjusting member 6 : filter mounting means
10 : frame

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BEST MODE FOR CARRYING OUT THE INVENTION

The present invention is described below in detail in reference to the attached drawings showing examples.

An optical filter for visual display terminals shown in Figs. 1 and 2 has a filter proper 1, a frame 2 for holding the filter proper 1, and side frame members 4 capable of being horizontally adjusted in relative position against a frame proper 3 of the frame 2.

The frame 2 comprises the frame proper 3 with a shape and size approximating the front shape and size of the visual display terminal (not illustrated) to have the filter mounted, and a top plate member 3b extending horizontally rearward from a top end of a front plate member 3a of the frame proper 3, and the filter proper 1 is mounted to cover the opening formed at the center of the front plate member 3a. Moreover, at the center of the top plate member 3b, an opening 3c used as an engaging portion is formed. The opening 3c may also be substituted by a recess. The frame proper 3 may be produced, for example, by injection molding of ABS resin.

Each of the side frame members 4 comprises a front plate member 4a almost as high as the front plate member 3a, a side plate member 4b extending rearward from the side end of the front plate member 4a, and a top plate member 4c connected to the top end of the front plate member 4a and to the top end of the side plate member 4b, and is connected to the frame proper 3 horizontally slidably by a sliding mechanism 7 described later. The side frame member 4 is provided at least

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on either side of the frame proper 3, and it is preferable to provide one each on both sides of the frame proper 3; most preferably, in symmetrical form in view of function and design. Each of the front plate members 4a has a cutout formed at a predetermined position as required, lest it should cover the opening of the front plate member 3a when it is slid most toward the frame proper 3. The side frame members 4 may be produced, for example, by injection molding of ABS resin.

The sliding mechanism 7 comprises, as shown in Figs. 3 and 4, a key 7a provided at a predetermined position on the rear face of the front plate member 3a, and a key way 7b formed at a predetermined position of the corresponding front plate member 4a. The key 7a has a recess formed at a predetermined position, and the corresponding one of protrusions 7d provided at predetermined positions of a presser plate 7c for pressing the periphery of the filter proper 1 is engaged with the recess of the key 7a, to ensure the engagement between the key 7a and the key way 7b. The sliding mechanism 7 is provided at each of the upper and lower predetermined positions of the respective side frame members 4. The sliding mechanism 7 may also be realized by a linear motion bearing, a guide shaft and a bearing bush, a rack and a pinion, etc. instead of a key and a key way, but considering weight reduction, cost reduction, simpler assembling process, and the using frequency of the sliding mechanism, it is preferable to use a key and a key way as the sliding mechanism. Furthermore, in this example, the presser plate 7c

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is used to press the periphery of the filter proper 1 and to prevent the disengagement between the key and the key way, but may also be substituted by another member to achieve these functions. It is preferable to form the key 7a apart from the side end of the front plate member 3a, for effectively suppressing the play of the side frame member 4.

Fig. 5 is an exploded perspective view showing the composition of the filter mounting member 6 provided on the top face of the main body of the visual display terminal, and it comprises a base member 6a to be mounted at a predetermined position on the top face of the main body of the visual display terminal, a height adjusting member 5 to be mounted as required on the top face of the base member 6a, and a top member 6b to be mounted on the top face of the base member 6a or the height adjusting member 5. At a predetermined position on the top face of the top member 6b, a protrusion to be engaged with said opening 3c is formed. The respective members may be fixed by using screws, etc., but it is preferable to use a both-side adhesive tape, adhesive agent, Velcro or repetitively usable pressure-sensitive adhesive tape, etc. for fixing them, since the respective members can be fixed without damaging the visual display terminal. The height adjusting member 5 may have a foldable portion to allow height adjustment by differently folding the foldable portion, but it is preferable to use or not to use at least one kind of height adjusting member 5 for height adjustment, or to selectively use height adjusting members 5 different in thickness for

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height adjustment. In the latter cases, the height adjusting member 5 is more reliable since it does not have any foldable portion. It is also possible to mount the filter mounting means 6 in either of the side members of the visual display terminal and to form the opening 3c to be engaged with the filter mounting means 6 in the corresponding side frame member. In this case, since the vertical position can be simply adjusted by changing the mounting position of the filter mounting means 6, the height adjusting member 5 is not required.

An optical filter for visual display terminals of the present invention as shown in Fig. 6 comprises a filter proper 1, a frame 10 for holding the filter proper 1, a top plate 10b connected to the top of the front frame 10a of the frame 10 tiltably at any optional position, side plates 10c and 10d connected to the sides of the front frame 10a tiltably at any optional positions, and corner members 11a and 11b for connecting the top plate 10b with the side plates 10c and 10d.

The front frame 10a of the frame 10 has a shape and size approximating the front shape and size of the visual display terminal (not illustrated) to have the filter mounted, and the filter proper 1 is mounted to cover the opening formed at the center of the front frame 10a. Moreover, the top plate 10b has an opening 10e formed to act as an engaging portion, and the side plates 10c and 10d have openings 10f and 10g formed to act as engaging portions. The openings 10e, 10f and 10g may be substituted by recesses. The openings 10e, 10f and

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10f are formed to be engaged with the filter mounting means 6 as shown in Fig. 5 described before, and if the openings are formed, the filter can be simply and reliably mounted onto and removed from the visual display terminal preferably.

5 The portion bendable at any optional position for tiltably connecting the front frame 10a with the top plate 10b, and the portions bendable at any optional positions for tiltably connecting the front frame 10a with the side frames 10c and 10d may be prepared by using any material with bending
10 resistance such as polypropylene resin or rubber, etc. At the portions, mechanisms such as hinges may also be adopted, but considering weight reduction, cost reduction and simpler assembling process etc., it is preferable to use a bendable material such as polypropylene resin.

15 The corner members 11a and 11b are provided to connect the top plate 10b with the side plates 10c and 10d, and may be produced, for example, by injection molding of ABS resin. For connection, it is preferable to use Velcro which allows easy disconnection and connection at any optional positions, but it
20 is also possible that plural recesses or holes formed in the top plate and the side plates are engaged with protrusions of the corner members. Depending on the positions of connection, clearances may be formed in the front portion. So, it is preferable to form the corner members in such a way as to
25 cover and hide the front portion as shown in Fig. 6.

When the optical filter for visual display terminals composed as shown in Fig. 1 is mounted onto a visual display

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terminal of an any model, both the side frame members 4 are horizontally slid to protrude most from the frame proper 3, and in this state, the filter mounting means 6 mounted onto the top of the main body of the visual display terminal is engaged with the opening 3c of the frame proper 3. Then, the front plate member 3a of the frame proper 3 is pivotally rotated to be almost parallel to the screen of the visual display terminal, and subsequently the side frame members 4 are slid in the direction reverse to the previous sliding direction, to suit the width of the visual display terminal, for completing the mounting of the optical filter onto the visual display terminal. In this state, since the width of the optical filter is almost equal to the width of the visual display terminal, it little gives any feeling of incompatibility, presenting good appearance.

Furthermore, when the optical filter for visual display terminals composed as shown in Fig. 6 is mounted onto a visual display terminal of an any model, the top plate and the side plates are properly tilted at any optional positions to suit the shape and size of the visual display terminal, and the top plate is connected with the side plates by the corner members, to mount the filter onto the visual display terminal, without giving almost any feeling of incompatibility.

Moreover, when the optical filter is not used, it can be compactly folded after removing the corner members effectively for storing and transport.

When the visual display terminal and the filter proper

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1 are considerably out of alignment in the vertical direction, the deviation can be properly corrected by using or not using the height adjusting member 5 of the filter mounting means 6, or using a height adjusting member different in height.

5 Even though not referred to specifically in the above description, if the screen of the visual display terminal is different in size, a differently sized optical filter need be used. However, if the sizes of the screens are almost the same (for example, in a range from 14 to 15 inches), making the
10 side frame members 4 slidable in a predetermined range (for example, about 40 mm for a screen size range of 14 to 15 inches) considering the differences among makers and models allows the optical filter to be used generally irrespective of the differences among makers and models. As a result, mass
15 production of a few kinds can be effected, to allow cost reduction. Furthermore, if the optical filters for visual display terminals are transported and stored with their size kept minimum, the space can be saved.

The optical filter for visual display terminals
20 according to claim 1 allows the optical filter to be mounted by adjusting the horizontal relative position of the side frame members to suit the shape and size of the visual display terminal to have the filter mounted, without giving almost any feeling of incompatibility. In addition, since one kind of
25 optical filters can be used for many kinds of visual display terminals, mass production of a few kinds can be achieved as a peculiar effect.

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The optical filter for visual display terminals according to claim 2 has a frame proper which is open at least at the bottom. So, when the optical filter is mounted onto the visual display terminal from above and removed from it upward, 5 the frame proper does not contact the visual display terminal, to assure very excellent handling convenience as a peculiar effect.

The optical filter for visual display terminals according to claim 3 has a height adjusting member between the 10 top face of the main body of the visual display terminal and the top face of the frame proper to correct the deviation in vertical relative position, when the screen may be out of alignment with the filter proper in the vertical direction depending on the kind of the visual display terminal.

15 The optical filter for visual display terminals according to claim 4 can prevent the optical filter from falling off by the engagement between the two engaging portions even if an impact, etc. is applied, and since the filter mounting means is mounted at the center on the top 20 face, the number of the filter mounting means can be kept at one to avoid the complicity of the structure. Furthermore, the optical filter can be simply removed by lifting it upward.

The optical filter for visual display terminals according to claim 5 can prevent the optical filter from 25 falling off by the engagement between the engaging portion and the filter mounting means even if an impact, etc. is applied.

The optical filter for visual display terminals

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according to claim 6 allows the optical filter to be mounted onto the visual display terminal without giving almost any feeling of incompatibility, since the top plate and the side plates can be tilted at any optional positions to suit the shape and size of the visual display terminal to have the filter mounted, and connected by the corner members.

The optical filter for visual display terminals according to claim 7 can prevent the optical filter from falling off by the engagement between the two engaging portions even if an impact, etc. is applied, and since the filter mounting means is mounted at the center on the top face, the number of the filter mounting means can be kept at one to avoid the complicacy of the structure. Furthermore, the optical filter can be simply removed by lifting it upward.

The optical filter for visual display terminals according to claim 8 can prevent the optical filter from falling off by the engagement between the engaging portion and the filter mounting means even if an impact, etc. is applied.

INDUSTRIAL FIELD

The present invention can present an optical filter for visual display terminals, which can be mounted onto any kinds of visual display terminals without any limitation without giving almost any feeling of incompatibility.

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CLAIMS

1. An optical filter for visual display terminals, which comprises a filter proper (1) with a shape corresponding to the visual display terminal to have the filter mounted, and a
5 frame (2) for holding the filter proper, comprising:
the frame (2) comprising a frame proper (3) with a predetermined depth and a front shape corresponding to the main body of the visual display terminal, for holding the filter proper (1), and side frame members (4) provided on both
10 sides of the frame proper (3) and capable of being horizontally adjusted in relative position against the frame proper (3).
2. An optical filter of claim 1, wherein the frame proper (3) is open at least at the bottom.
- 15 3. An optical filter of claim 1 or 2, further comprising a height adjusting member (5) provided between the top face of the main body of the visual display terminal and the top face (3b) of the frame proper (3) of the frame (2), for adjusting the relative vertical position between the screen of the
20 visual display terminal and the filter proper (1) of the optical filter.
4. An optical filter of any one of claims 1, 2 or 3, further comprising an engaging portion (3c) provided on the top face (3b) of the frame proper (3) of the frame (2), and a filter
25 mounting means (6) to be detachably engaged with the engaging portion (3c), and the filter mounting means (6) is fixed on the top face of the main body of the visual display terminal,



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to keep the filter mounted onto the visual display terminal.

5. An optical filter of any one of claims 1, 2 or 3, further comprising an engaging portion provided on the side frame member (4) of the frame (2), and a filter mounting means (6)

5 to be detachably engaged with the engaging portion, and the filter mounting means (6) is fixed on both sides of the main body of the visual display terminal, to keep the filter mounted onto the visual display terminal.

6. An optical filter for visual display terminals, which
10 comprises a filter proper (1) with a shape corresponding to the screen of the visual display terminal to have the filter mounted, and a frame (10) for holding the filter proper, comprising;

the frame (10) comprising a front frame (10a) with a shape
15 corresponding to the main body of the visual display terminal, a top plate (10b) and side plates (10c) and (10d) connected to the front frame tiltably at any optional positions, and corner members (11a) and (11b) for connecting the top plate (10b) with the side plates (10c) and (10d).

20 7. An optical filter of claim 6, further comprising an engaging portion (10e) provided on the top plate (10b) of the frame (10), and a filter mounting means (6) to be detachably engaged with the engaging portion (10e), and the filter mounting means (6) is fixed on the top face of the main body
25 of the visual display terminal, to keep the filter mounted onto the visual display terminal.

8. An optical filter of claim 6 or 7, further comprising



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engaging portions (10f) (10g) provided on the side plates (10c) (10d) of the frame (10), and filter mounting means (6) to be detachably engaged with the engaging portions (10f) (10g), and the filter mounting means (6) are fixed on the side faces 5 of the main body of the visual display terminal, to keep the filter mounted onto the visual display terminal.

