

TITLE: Display Panel



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FIELD OF THE INVENTION

This invention relates to a display panel having a variable display which can be utilised for the purposes of displaying advertisements, important notices and the
5 like where a number of advertisements, notices or the like can be displayed over a period of time.

A particular application of the invention relates to a display panel which can be used in an exterior location and which provides a pair of display faces.

BACKGROUND

10 Prior art to the present invention comprises Australian patent specifications, 17230/95, 69644/94, 68371/94, 39735/93, 66319/90, 89190/91, US specifications 5557878, 5465515, 5488791, 5412892, 5410830, 5138781, 5003717, 4965947, 4773176, 4707938, 4110925, 3616554, 3510973, Canadian specification 2118890, International specification WO 96/12266, and European
15 specification 603075. Each of these prior art documents describe display arrangement where a flexible display screen bearing a display is caused to be moved past a display screen in order that the discrete displays are able to be seen at the display face. However a difficulty which has arisen with such displays relates to the need to be able to readily change the display from time to
20 time.

It is an object of the invention to provide a variable display where the discrete display can be readily changed.

DISCLOSURE OF THE INVENTION

Accordingly the invention resides in a display panel comprising a housing having
25 a front face having a display face; said housing rotatably supporting a pair of rollers located in substantially parallel relationship to opposed sides of the



display face; said rollers capable of supporting between themselves a screen having a multiple of display panels which are each of substantially corresponding configuration to the display face; a drive means adapted to cause rotation of one of the rollers to cause the screen to move from the other of the rollers and over
5 the one roller; a control means to cause the activation of the drive means of the one roller to cause movement of the screen across the display face such that each display panel is located across the display face and is held at that position for a period of time; the housing further supporting an illumination means located rearwardly of the display face and the screen to be supported by the rollers; said
10 rollers, drive means and illumination means being supported on a carriage supported from the housing; the carriage being supported from the housing to be moveable between a first position located within the housing and rearward of the display face and a second position at which the carriage is located outwardly from the housing at which second position the rollers, screen and illumination
15 means are accessible.

According to a preferred feature of the invention the housing has a second display face and the carriage accommodates a pair of second rollers located in substantially parallel relationship to opposed sides of the second display face; said second rollers capable of supporting between themselves a second screen
20 having a multiple of display panels of substantially corresponding configuration to the second display face; a second drive means adapted to cause rotation of one of the second rollers to cause the screen to move from the other of the second rollers and over the one second roller;. said control means controlling the second drive means; the second screen being between the illumination means
25 and the second screen. According to one embodiment the display faces are substantially parallel and the screen are located to opposite sides of the illumination means. According to another embodiment the first and second screen comprise a common screen which is caused to move past both the first and second display face.

30 According to a preferred feature of the invention said control means also controls the operation of the illumination means such that the illumination means is

deactivated when the drive means is activated to cause movement of the screen. According to a further feature of the invention the display face is adapted to be able to restrict visual access through the display face when the illumination means is inactive. According to one embodiment the display face is
5 treated to be transparent to light emanating from the illumination means but restricts the visibility of the display panel at the display face when the illumination means is inactive.

According to a preferred feature of the invention the screen is rolled onto one or both of said rollers and has a length which is a multiple of the spacing between
10 the rollers, whereby on rotation of one of the rollers by the drive means the screen is caused to be unrolled from the other roller, moved past the display face and rolled onto the one roller. According to a further preferred feature of the invention each of the rollers can be selectively driven to cause the screen to be rolled onto the roller which is driven by the drive means.

15 According to a preferred feature of the invention the control means is capable of causing both a disengagement between the drive means and the other roller and the activation of the drive means of one of the rollers to cause the movement of the screen. According to a further preferred feature of the invention a braking means is associated with the other roller, said braking means being activated by
20 the control means to control the rotation of the other roller when causing the rotation of the one roller.

According to a preferred feature of the invention each of the rollers are associated with an elongate bearing member which is coextensive with each roller and is provided with a bearing surface, said bearing member being
25 resiliently biased such that said bearing surface engages the exterior surface of the roller and the portion of the screen carried thereby.

According to a preferred feature of the invention the carriage is slidably supported within the housing to be movable in a direction parallel to the display face, one side of the housing being capable of being opened to enable the
30 carriage to be moved outwardly from the side of the housing to the second

position, at which position at least most of the carriage is located substantially outside the housing and is supported from the housing. According to a further preferred feature of the invention the carriage is supported from the housing by a telescopic track. According to one embodiment the side wall comprises a lateral wall of the housing. According to a further embodiment the side wall comprises the upper wall of the housing. According to a further embodiment the side wall comprises the lower wall of the housing.

According to a preferred feature of the invention the display face is hingedly supported from the housing to be movable to an open position at which it extends away from the housing, said carriage being supported from the housing by a linkage which is capable of moving the carriage out of the housing when the display face is in the open position and supporting the carriage at the second position. According to a further preferred feature of the invention the linkage comprises a pair of arms pivotally supported at one end from opposite sides of the housing and the carriage is pivotally supported between the arms at a position spaced from their one end. According to a further preferred feature of the invention the carriage is supported from the other end of said arms. According to a further preferred feature of the invention the carriage is supported from the arms to be pivotable about a central axis of the carriage. According to one embodiment the arms each comprise a single elongate member mounted at one end to an end of the respective side of the housing. According to another embodiment the arms comprise a plurality of link members which are pivotally interconnected to provide an articulated linkage.

According to a preferred feature of the invention the drive means comprises a drive motor for each roller where each drive motor is operatively connected to the respective roller through a clutch mechanism, said control means controlling the activation of the drive motor and the clutch mechanism to effect the movement of the screen.

According to a preferred feature of the invention the illumination means comprises a substantially planar array of elongate fluorescent tubes which extends for at least a significant proportion of the height of the display face, said

tubes being arrayed in a substantially parallel array, the outermost fluorescent tubes being spaced inwardly from the proximate edges of the display face, a first reflector extending outwardly from the outermost fluorescent tubes and comprising a pair of reflective panels which each have a first edge adjacent the
5 respective outermost fluorescent tubes and which diverge therefrom. According to one embodiment the array comprises two rows of parallel fluorescent tubes. According to another embodiment the array comprises three rows of parallel fluorescent tubes. According to a feature of each embodiment each row comprises a single elongate fluorescent tube. According to a further preferred
10 feature the panels are substantially planar. According to a further preferred feature of the invention a second reflector is located between the parallel fluorescent tubes and extending for substantially the full length of the array parallel fluorescent tubes. According to a preferred embodiment the, wherein said second reflector is substantially planar. According to one embodiment the
15 second reflector comprises a reflective blind. According to an alternative embodiment the second reflector comprises a substantially rigid panel. According to a further feature of the embodiment the panel is pivotally supported from the carriage to be pivotable about an axis which is substantially parallel to the fluorescent tubes.

20 The invention will be more fully understood in light of the following description of several specific embodiments.

BRIEF DESCRIPTION OF THE DRAWINGS

The description is made with reference to the accompanying drawings of which:

25 Figure 1 is a schematic sectional side elevation of a display panel according to the first embodiment;

Figure 2 is an end elevation of the display panel according to the first embodiment through one end face;

Figure 3 is a plan view of the carriage according to the first embodiment;

Figure 4 is a side elevation of the carriage according to the first embodiment;

Figure 5 is a cross-sectional view of the carriage according to the first embodiment along line 5-5 of Figure 4;

5 Figure 6 is a schematic sectional view of the bearing member which is associated with each roller;

Figure 7 is a schematic plan view of the carriage according to the second embodiment;

10 Figure 8 is a schematic plan view of the display panel of the third embodiment illustrating the first and second positions of the carriage; and

Figure 9 is a schematic side elevation of the fourth embodiment.

DESCRIPTION OF THE EMBODIMENTS OF THE INVENTION

The first embodiment is directed to a display panel which can be used as a side wall of a bus shelter or like structure and which is able to provide a display face
15 on each of its major faces at which suitable advertisements or notices can be displayed whereby those advertisements and displays or notices can be changed over a period of time to provide for a variable display.

The display panel comprises a closed housing 11 having a front face 12 and a rear face 13 which are supported in substantially parallel spaced relation by and
20 which are each provided with a transparent display face 14. The upper wall lower wall and side walls are closed to define a closed space within the housing. One side wall 16 is closed by a removable panel which can be removed to provide access to the interior of the housing for substantially the full height of the housing. The lower portion of the housing 11 is provided with a set of lower
25 extensions 15 which serve to provide for ground support for the panel and which can be mounted to suitable brackets fixed to the ground.

The housing accommodates a carriage 20 which is supported in the housing by a suitable telescopic track mechanism 21 supported on the upper and lower wall

of the housing. The support provided by the telescopic track mechanism enables the carriage to moveable from a first position as shown in Figure 1 where it is fully accommodated within the housing to be located between the front and rear faces 12 and 13 of the display panel to a second position (not shown) at which the carriage is supported from the housing to lie outside the housing and to one side of the housing. In order to enable the carriage to move from the first position to the second position the removable panel on the one end wall 16 is removed.

The carriage comprises a substantially rectangular frame which comprised an upper member 22 and a lower frame member 23 which are supported by suitable side frame members. The upper frame member is supported from the upper portion of the telescopic track mechanism whilst the lower frame member is supported by the lower portion of the telescopic track mechanism. Each face of the carriage which is in opposed relation to the respective front or rear face 12 or 13 is provided with a pair of driven rollers 24 and 25 which are located at opposite sides of the carriage. The rollers 24 and 25 are parallel and each comprise a roller member which is adapted to support a screen. To support the rollers suitable rotatable support spigots are provided at each end of each side of the frame on the upper and lower frame members 22 and 23 such that four pairs of spigots are located in opposed relation on the frame. The rotatable spigots are engagable with the respective end of the respective rollers in order that the rollers are rotatably supported between the frame members 22 and 23. The mounting of the rollers to the opposed spigots is such that the rollers are able to be readily disengaged from between opposed spigots as required. This can be effected by having at least one of the opposed spigots capable of being resiliently moved axially out of engagement with the end of the roller. The upper spigot of each opposed pair of spigots is associated with a drive motor 26 which is drivingly engagable with the upper spigot through a suitable clutch mechanism (not shown).

Each side of the upper and lower frame member 22 and 23 is provided with a guide surface 27 which extends for the length of the respective frame member

between the opposed rollers 24 and 25. The guide surface 27 is defined by a flange on the respective frame member and is closely spaced from the internal surface of the respective display face.

Each pair of rollers 24 and 25 are associated with a screen which is rolled onto one of the rollers. This can be done when the roller is disengaged from the carriage. The screen has a width greater than the spacing between the opposed edges of the guide surfaces 27 on the upper and lower frame members. The screen comprises a plurality of display panels each having a configuration substantially corresponding to the configuration of the display face. In use the screen can be moved between the rollers to enable each display panels to be located opposite the respective display face. The other roller supports a length of leader tape (not shown). On a roller being loaded with a screen it is located within the carriage by being engaged between a pair of opposed spigots and the screen is extended across the relevant face of the carriage and its free edge is engaged with the length of leader tape supported by the other roller in order that the screen is extended across the carriage to overlie the guide surfaces 27 associated with the upper and lower frame members 22 and 23. The screen is supported such that when the carriage is in its first position within the housing 11, the screen will be supported from the rollers and by the guide surfaces and such that it will pass closely adjacent the internal surface of the display face 14 of the respective front or rear face 12 and 13.

The drive motors 26 are activated by a programmable control means which is able to activate the drive motors to cause rotation of the respective roller such that the screen is wound onto that roller whilst the other drive motor 26 is disconnected from the other drive roller through the clutch mechanism to allow the other roller to rotate and permit the screen to be wound from it. It is a feature of the first embodiment that a braking force is applied to the other roller 25 in order that the screen is tensioned in its passage from the other roller to the one roller. This braking force may be effected by short periodic activation of the clutch mechanism providing connection between the other roller and the drive motor or by a frictional bearing supporting each spigot which will allow free

rotation of the spigot when the screen is being wound onto the roller by the respective drive motor but will apply a frictional drag to the spigot when the screen is being wound off the roller or by any other suitable means.

In addition in order to further tension the screen in its passage from the other
5 roller to the one roller, each roller is associated with an elongate bearing member 30 (see Figure 6) which is coextensive with the roller member and is pivotally supported from the frame of the carriage about a pivot axis 31. The bearing member has an elongate bearing surface 32 which will bear upon the surface of the screen accommodated by the roller. It has been found that the
10 bearing member 30 serves to provide some tension to the screen between the rollers and to prevent gathering of the screen in its passage between the rollers.

In addition in order to control the movement of the screen between the rollers, the spacing between the guide surface 27 and the opposed face of the respective display face is such that the screen is held by the guide surface in
15 closely spaced relation to the internal surface of the display face.

The carriage also supports an illumination means comprising a set of fluorescent lamps 40 which extend between the upper frame member 22 and the lower frame member 23 and which are spaced along the central axis of the carriage such that they will illuminate the rear face of both the rear display face 12 and
20 13. In addition the illumination means comprises a pair of reflector members 41 which extend between the outermost fluorescent lamp 40 at each side of the carriage and the respective side of the carriage and which are divergent from the central plane of the carriage in order to provide for some reflection of the light incident thereon onto the outer edges of the display face. In addition the space
25 between each fluorescent lamp is closed by a reflective and/or translucent blind 42. The blinds 42 serve to prevent visual access from one side of the carriage to the other and serve to prevent the display at one display face being affected by the display at the other display face

In addition each display face on the front and rear face 12 and 13 is tinted such
30 that when the illumination means is deactivated visual access into the interior of

the display panel is blocked or at least restricted but when the illumination means is activated the display panel is capable of being seen through the face.

The drive motors 26 and the lamps 40 are controlled by a control mechanism. The control for the drive motors is such that the screen can be caused to be
5 moved across the respective display face from one roller to another to bring each of the display panels carried by the screen into position across the respective display face and can be held at that position for a desired period of time before being moved. If desired the display time for each panel may be varied as desired. The manner in which the display panels are displayed can be
10 sequential or in whatever order may be determined by the programming of the control means. In addition the control means controls the illumination means 40 in association with the drive means to cause activation of the illumination means when the display panel is in use only when the display is stationary. The control of the illumination means by the control means is such that when the drive
15 motors 26 are activated to cause movement of the screen, the illumination means is deactivated such that there is substantially no visual display viewable through the respective display face.

In use when the display panel is to be loaded with a display screen or when an existing display screen is to be changed the removable panel on the one side
20 wall is removed and the carriage is moved to its second position. At this position the rollers and screens at each side of each face of the carriage can be accessed. To change a screen the leader tape is disconnected from the screen already present on the carriage and the screen is fully wound onto the one roller. The one roller is then removed from the carriage and is replaced by a fresh one
25 roller having a fresh screen thereon. When the fresh roller is in position the screen is fixed to the leader tape on the other roller. This action can be done for the screens at each face of the carriage with the carriage in the second position.

The first embodiment provides a display panel which is able to provide two display faces where the display at each face can be varied. The display panel
30 enables a number of displays to be displayed at varying intervals of time in whatever order may be required. In addition the display panels which are to be

displayed can be readily changed. Furthermore when the display panel to be displayed at the display face is changed the illumination means is deactivated and the moving display panel is restricted from view due to the tinting of the display face. In addition the display panel of the first embodiment enables the display to be readily changed and the active components of the display panel to be serviced as a result of the carriage being movable out of the housing to the second position.

In the case of the second embodiment as shown at Figure 7 this differs from the first embodiment in relation to the illumination means. In the case of the second embodiment the illumination means comprises a pair of tubular fluorescent lamps 40. The lamps are associated with a pair of reflector members 41 at each side of the carriage which are similar those provided in the first embodiment. The difference in the case of the second embodiment resides in the presence of a reflector panel 50 between the lamps instead of the blinds 42 of the first embodiment. In addition the reflector panel is capable of being pivoted about a central longitudinal axis 52 to an oblique position as shown in broken lines to enable the lamps to be replaced.

In the case of the third embodiment as shown at Figure 8 this differs from the first embodiment by the nature of mounting of the carriage 20 within the housing and the manner in which the carriage can be accessed for servicing and replacement of the screens. In the case of the third embodiment one of the faces 12 of the display panel is hingedly supported from one side of the housing in order that it can be swung away from the housing to provide access into the interior of the housing. In addition the carriage is supported in the housing by a pair of arms 60. The arms 60 are pivotally mounted at one end from the upper and lower wall of the housing where the mounting of each arm to the upper and lower wall is located at one end of each end wall. The other end of each arm is pivotally mounted to the centre of the respective frame member of the carriage 20. As a result of the support provided for the carriage by the arms 60, when the housing is opened by pivoting the one face 12 from the housing as shown at Figure 8 the arms can be pivoted with respect to the frame to move the carriage

out of the housing as shown at Figure 8 and when at that position the carriage 20 can be pivoted on the arms to facilitate access to all of the components of the carriage.

The fifth embodiment as shown at Figure 9 comprises a feature which can be incorporated into each of the embodiments described above. In the case of the fifth embodiment each frame member is provided with an aperture 70 adjacent each roller 24 and 25. The apertures are located in the frame member to each side of the screen. The apertures are intended to be engaged with a locking bar 72 which supports a pair of locking pins 74 which are spaced along the bar a distance corresponding to the spacing of the apertures 70 adjacent each roller. In use the locking bar 74 is fixed across the screen adjacent each roller by location of the pins 74 into apertures in the frame members. As a result the screen is clampingly retained by the locking bars to facilitate the removal of the display panel therebetween.

In the event that it becomes necessary or it is desired to remove a display panel from a screen and if desired replace the display panel with an alternative panel the screen is indexed across the display face until the display pane to be removed is located across the display face. The screen is then held in position by the locking bars 72 by locating locking pins 74 of each bar through the respective apertures at each side of the apertures display panel. The portion of the screen accommodating the undesired display panel is then removed from the screen by cutting the display panel from the screen. A new display panel can then be spliced to the screen or alternatively one of the ends of the screen created by the cutting action can then be disengaged from the respective locking bar and spliced to the other end of the screen created by the cutting action. The locking bars enable the screen to be supported from the carriage during the extraction of the undesired display panel and the insertion of a fresh display panel.

According to a variation of the fifth embodiment the apertures are located in the guide surfaces and the screen is provided with a series of holes along each edge which will pass over the apertures with movement of the screen between

the rollers. The apertures are associated with a set of locking pins which can be received through the aligned holes in the screen and the apertures to hold the screen in position while the undesired display panel is removed and a fresh panel is spliced into the screen.

- 5 It has been found that in use the illumination means of each of the embodiments provides a uniform illumination of the display face through the screen whereby the differential intensity of the individual fluorescent tubes is lost. It is a characteristic of prior art devices that the presence of the individual fluorescent tubes can be detected as a result of a variation of the intensity of the light which
- 10 is incident upon the display face. In the case of each of the embodiments the distribution of light to the display face as a result of the first reflectors between the outermost tubes and the respective side of the display panel and the second reflectors between the parallel tubes is substantially uniform across the display face. As a result a high quality display is created at the display face by the
- 15 display screen and the illumination means is

Throughout the specification, unless the context requires otherwise, the word "comprise" or variations such as "comprises" or "comprising", will be understood to imply the inclusion of a stated integer or group of integers but not the exclusion of any other integer or group of integers.

- 20 It should be appreciated that the scope of the present invention need not be limited to the particular scope of the embodiment described above.

CLAIMS

The claims defining the invention are as follows:

1. A display panel comprising a housing having a front face having a display face; said housing rotatably supporting a pair of rollers located in substantially parallel relationship to opposed sides of the display face; said rollers capable of supporting between themselves a screen having a multiple of display panels which are each of substantially corresponding configuration to the display face; a drive means adapted to cause rotation of one of the rollers to cause the screen to move from the other of the rollers and over the one roller; a control means to cause the activation of the drive means of the one roller to cause movement of the screen across the display face such that each display panel is located across the display face and is held at that position for a period of time; the housing further supporting an illumination means located rearwardly of the display face and the screen to be supported by the rollers; said rollers, drive means and illumination means being supported on a carriage supported from the housing; the carriage being supported from the housing to be moveable between a first position located within the housing and rearward of the display face and a second position at which the carriage is located outwardly from the housing at which second position the rollers, screen and illumination means are accessible.
2. A display panel as claimed at claim 1 wherein the housing has a second display face and the carriage accommodates a pair of second rollers located in substantially parallel relationship to opposed sides of the second display face; said second rollers capable of supporting between themselves a second screen having a multiple of display panels of substantially corresponding configuration to the second display face; a second drive means adapted to cause rotation of one of the second rollers to cause the screen to move from the other of the second rollers and over the one second roller; said control means controlling the second drive means; the second screen being between the illumination means and the second screen.

3. A display panel as claimed at claim 1 or 2 wherein said control means also controls the operation of the illumination means such that the illumination means is deactivated when the drive means is activated to cause movement of the screen.
- 5 4. A display panel as claimed at claim 3 wherein the display face is adapted to be able to restrict visual access through the display face when the illumination means is inactive.
5. A display panel as claimed at claim 3 or 4 wherein the display face is treated to be transparent to light emanating from the illumination means but restricts
10 the visibility of the display panel at the display face when the illumination means is inactive.
6. A display panel as claimed at any one of the preceding claims wherein the screen is rolled onto one or both of said rollers and has a length which is a multiple of the spacing between the rollers, whereby on rotation of one of the
15 rollers by the drive means the screen is caused to be unrolled from the other roller, moved past the display face and rolled onto the one roller.
7. A display panel as claimed at claim 6 wherein each of the rollers can be selectively driven to cause the screen to be rolled onto the roller which is driven by the drive means.
- 20 8. A display panel as claimed at claim 8 wherein the display faces are substantially parallel and the screens are located to opposite sides of the illumination means.
9. A display panel as claimed at claim 8 or 9 wherein the first and second screen comprise a common screen which is caused to move past both the
25 first and second display face.
10. A display panel as claimed at any one of the preceding claims wherein invention the control means is capable of causing both a disengagement

between the drive means and the other roller and the activation of the drive means of one of the rollers to cause the movement of the screen.

11.A display panel as claimed at claim 10 wherein a braking means is associated with the other roller, said braking means being activated by the control means to control the rotation of the other roller when causing the rotation of the one roller.

12.A display panel as claimed at any one of the preceding claims wherein each of the rollers are associated with an elongate bearing member which is coextensive with each roller and is provided with a bearing surface, said bearing member being resiliently biased such that said bearing surface engages the exterior surface of the roller and the portion of the screen carried thereby.

13.A display panel as claimed at any one of the preceding claims wherein the carriage is slidably supported within the housing to be movable in a direction parallel to the display face, one side of the housing being capable of being opened to enable the carriage to be moved outwardly from the side of the housing to the second position, at which position at least most of the carriage is located substantially outside the housing and is supported from the housing.

14.A display panel as claimed at claim 13 wherein the side wall comprises a lateral wall of the housing.

15.A display panel as claimed at claim 13 wherein the side wall comprises the upper wall of the housing.

16.A display panel as claimed at claim 13 wherein the side wall comprises the lower wall of the housing.

17.A display panel as claimed at any one of claims 13, 14, 15, or 16 wherein the carriage is supported from the housing by a telescopic track.

18. A display panel as claimed at any one of claims 1 to 12 wherein the display face is hingedly supported from the housing to be movable to an open position at which it extends away from the housing, said carriage being supported from the housing by a linkage which is capable of moving the carriage out of the housing when the display face is in the open position and supporting the carriage at the second position.
19. A display panel as claimed at claim 18 wherein the linkage comprises a pair of arms pivotally supported at one end from opposite sides of the housing and the carriage is pivotally supported between the arms at a position spaced from their one end.
20. A display panel as claimed at claim 19 wherein the carriage is supported from the other end of said arms
21. A display panel as claimed at claim 19 wherein the carriage is supported from the arms to be pivotable about a central axis of the carriage.
22. A display panel as claimed at any one of claims 19 to 21 wherein the arms each comprise a single elongate member mounted at one end to an end of the respective side of the housing.
23. A display panel as claimed at any one of claims 19 to 21 wherein the arms comprise a plurality of link members which are pivotally interconnected to provide an articulated linkage.
24. A display panel as claimed at any one of the preceding claims wherein the drive means comprises a drive motor for each roller where each drive motor is operatively connected to the respective roller through a clutch mechanism, said control means controlling the activation of the drive motor and the clutch mechanism to effect the movement of the screen.
25. A display panel as claimed at any one of the preceding claims wherein the illumination means comprises a substantially planar array of elongate

fluorescent tubes which extends for at least a significant proportion of the height of the display face, said tubes being arrayed in a substantially parallel array, the outermost fluorescent tubes being spaced inwardly from the proximate edges of the display face, a first reflector extending outwardly from the outermost fluorescent tubes and comprising a pair of reflective panels which each have a first edge adjacent the respective outermost fluorescent tubes and which diverge therefrom.

26. A display panel as claimed at claim 25 wherein the array comprises two rows of parallel fluorescent tubes.

27. A display panel as claimed at claim 25 wherein the array comprises three rows of parallel fluorescent tubes.

28. A display panel as claimed at claim 26 or 27 wherein each row comprises a single elongate fluorescent tube.

29. A display panel as claimed at any one of claims 25 to 28 wherein the reflective panels are substantially planar.

30. A display panel as claimed at any one of claims 25 to 29 wherein a second reflector is located between the parallel fluorescent tubes and extends for substantially the full length of the array parallel fluorescent tubes.

31. A display panel as claimed at claim 30 wherein said second reflector is substantially planar.

32. A display panel as claimed at claim 30 or 31 wherein the second reflector comprises a reflective blind.

33. A display panel as claimed at claim 30 or 31 wherein the second reflector comprises a substantially rigid panel.

34. A display panel as claimed at claim 33 wherein the panel is pivotally supported from the carriage to be pivotable about an axis which is substantially parallel to the fluorescent tubes.

35. A display panel substantially as herein described