Blind with tear resistant fabric

A roller blind comprises a roller, a sheet of flexible fabric, attached to the roller at one end, wherein the flexible fabric comprises a puncture/tear resistant fabric. The material may have a tensile strength greater than 2000Mpa and may be manufactured from an aromatic polyamide (aramid) or para-aramid synthetic fibre, ultra high molecular weight polyethylene, poly (p-phenylene-2, 6 benzobisoxazole, knitted, woven or non-woven fabric, metallic mesh or laminate. There may be a layer of reflective, thermal or noise insulation material. There may be a guide for engaging the side edge of the fabric and one or two securing components mounted to a bar attached to the lower end of the fabric. A roller retainer may be used to retain or catch the roller if it falls off its fixings (Fig 12). Also claimed is a roller blind with a mounting element for the roller, fabric or an element mounted thereon where the mounting element has at least one air vent.
Security blind

The present invention relates to a blind for windows and doors. In particular the invention relates to a blind for improved security.

Security device are used on doors and windows in shops and business to prevent burglary and vandalism. There are two main types of commercially available security devices for doors and windows, roller shutters and security grills.

Roller shutters are typically mounted on the external side of the door or window. The roller shutter typically comprises metallic slats which may be rolled up into a housing mounted at the top of the door or window surround. Side rails are typically mounted on the sides of the door or window surround, so that when the roller shutter is drawn down from the housing, the sides engages with the side rails. The roller shutter can be unrolled to cover the doorway or window, where it can be locked in position or retracted to be stored in the housing.

Roller shutters are not suitable for domestic use as they are not aesthetically pleasing. Furthermore, as they are mounted on the external side of the door or window, they are not practical for all domestic windows and doors, for example where the exterior side of the door or window is not easily accessible, such as windows not on the ground floor.

Security grills typically comprise a metallic lattice structure which can extend across the doorway or window. Top and bottom rails are mounted in the door or window surround to engage with the top and bottom of the lattice structure, which can slide to fully extend across the doorway or window, where it can be locked in position, or can retract to a stowed position at one end. As with roller shutter, these are not aesthetically pleasing and therefore inappropriate for domestic use.
A first aspect of the present invention provides a roller blind comprising:

- a roller, rotatable about its longitudinal axis;
- a sheet of flexible fabric, attached to the roller at one end;

wherein the flexible fabric comprises a tear resistant fabric.

Use of a tear resistant fabric in the roller blind provides protection against attacks by knives and other sharp objects and thus assists in preventing intrusion through the doorway or window where the blind is in use.

The tear resistant fabric is preferably capable of withstanding the force of a knife blade, for example pulled by a potential intruder. The blade’s cutting action may be stopped by one or more fibres or a gathering effect of an accumulation of fibres as the material yields slightly under pressure.

The flexible fabric may additionally or alternatively comprise a puncture resistant fabric and this provides a further aspect of the present invention.

The tear resistant fabric may comprise a fabric made from fibres having a tensile strength of greater than about 2000MPa. More preferably the tear resistant fabric comprises a fabric made from fibres having a tensile strength of greater than about 3000MPa.

Suitable fabrics include fabrics comprising an aromatic polyamide (aramid) synthetic fibre. An aramide is defined as a manufactured fiber in which the fiber-forming substance is a long-chain synthetic polyamide in which at least 85% of the amide linkages, (-CO-NH-) are attached directly to two aromatic rings. The puncture proof fabric may comprise a para-aramid
synthetic fibre, such as Kevlar™, Twaron™, Nomex™ and Technora™. These fibres have high tensile strength, for example the tensile strength of Kevlar 29 is 3600 Mpa, Kevlar 49 is 3800 MPa and Kevlar 149 is 3400 Mpa.

Other suitable fabrics include fabrics comprising fibres of ultra high molecular weight polyethylene (UHMWPE), for example Certran™, Dyneema™, Kyneema™ or Spectra™. The tensile strength of Spectra fiber 900 (4800 Denier) is 2.18 GPa. Suitable fabrics also include fabrics comprising fibres of poly (p-phenylene-2,6-benzobisoxazole) (PBO), such as Zylon™. Zylon™ fibre has a tensile strength of 5800 MPA. Another suitable fibre is Vectra™, a polyester based liquid crystal fibre manufactured by Hoechst Celanese which has a tensile strength of between 1100 and 3200 MPa.

The tear resistant fabric may be a woven or a knitted fabric. The tear resistant fabric may combine a non woven fabric, for example a fabric comprising Cuben Fibre™, which comprises a laminated fabric constructed from plasma treated UHMWPE fibres and monofilament polyester film.

The tear resistant fabric may comprise a fine metal mesh. Preferably the fine metal mesh is used in combination with another material to give the desired structure.

The tear resistant fabric may be single ply or alternatively it may comprise a laminate. The use of a laminate has the advantage that different properties can be added to the blind, with a material of the desired property comprising a layer in the laminate. The laminate may include a reflecting layer, for example foil. This reflecting layer reduces heat loss from inside and reduces UV light transmitted through the blind. The laminate may include an insulation layer, for example foam, wool or lint to provide heat and/or noise insulation. The laminate may include a white or light coloured outer layer. This layer
reflects UV radiation, minimising absorption into the blind. The external layer may include a decorative layer, this may be provided on a printable fabric, for example a natural or synthetic material, such as cotton, rayon or nylon. At least one of the layers is preferably opaque to prevent light penetration, thus creating a ‘black out’ blind. Use of a laminate structure has the advantage that an outer layer can be used to provide protection of the tear resistant layer (for example Kevlar™ layer) against UV degradation.

In a particular embodiment, the fabric comprises a laminate structure, comprising one or more layers of tear resistant fabric and one or more layers of a material having a property of at least one of reflection, thermal and/or noise insulation.

A laminate fabric has the further advantage that two or more layers of tear resistant fabric can be used with their weave aligned in different directions. Additionally, the tear resistant fabric may comprise two or more layers of different materials, for example Kevlar™ bonded onto plastics material.

The roller blind may additionally include a housing, in which the roller is housed. The housing is further provided with mounting means for mounting to a door, window or surround.

The security of the roller blind is further improved by ensuring the tear resistant fabric is secured in position when in its extended position.

In one embodiment a securing device is provided to secure the roller blind in an extended position. The securing device may comprise first and second inter-engageable securing components, the first securing component mountable on the sheet of flexible fabric or an element mounted thereto and the second securing component mountable to a door, window or surround or an element mounted thereto. Preferably the securing device is not
accessible from the exterior of the blind (i.e. the window or door side) when in use.

The securing device may comprise, for example, a lock or a catch.

The roller blind may further comprise guides for mounting on the door, window or surround. Preferably the edges of the flexible sheet are provided with engagement features for engaging with the guides.

The end of the flexible sheet opposite the roller may have a bar mounted thereto. The securing device preferably comprises a first securing component mounted on the bar and a second securing component mounted on the door, window or surround or an element mounted thereto, for example the window sill or a guide.

The securing device may be actuated between secured and unsecured states by an actuator, such as a key or push-button. Suitable securing devices include mechanical, magnetic and self latching systems.

The roller blind may be operated manually. Alternatively, the roller blind may be provided with a drive mechanism. The drive mechanism may be used to lock the roller blind in place by preventing rotation of the roller. Suitable drive mechanism include mechanical, manual, spring loaded, hydraulic and counterweight drive systems.

One or more securing devices may be provided towards the free end of the flexible sheet opposite from the roller. Two or more securing devices may be provided, on opposite sides of the flexible sheet. Additionally, one or more securing devices may be provided towards the end of the flexible sheet attached to the roller. Securing devices may be provided, on opposite sides of the flexible sheet.
In a preferred embodiment, the flexible fabric sheet is dimensioned so that it covers the door or window when fully extended. The roller blind when extended thus creates a barrier on one side of the window or doorway.

When conventional blinds are in their extended position they limit airflow, the reduction in air flow becomes worse as the fit of the blind to the window or doorway improves.

A second aspect of the present invention provides a roller blind comprising:
a roller, rotatable about its longitudinal axis;
a sheet of flexible fabric, attached to the roller at one end;
at least one mounting element, which is mountable to a surface and which in use is engageable with the roller, fabric or an element mounted thereon, wherein the at least one mounting element is provided with one or more air vents.

The at least one mounting element may comprise a casing which houses the roller.

In one embodiment the roller blind comprises engagement features mountable onto a door, window or surround into which edges of the flexible material or elements mounted thereto engages when it is extended. The use of these engagement features has the advantage that it improves security by fixing the blind in place against the door, window or surround. This can also reduce the effect of noise and light passing through the blind, which is further reduced if a snug fit is provided between the blind and the door, window or surround. This can be further reduced by use of a seal. The provision of air vents in the support element, such as the casing or engagement features thus provides good ventilation whilst enabling good security and black out from light and noise insulation.
A seal provided between the fabric and the profiles or surround forms another aspect of this invention. The profiles may comprise the at least one mounting element, such as the engagement features mountable onto a door, window or surround.

The seal may be formed by the engagement features and flexible sheet when the flexible sheet is extended. Preferably the engagement features comprise gaskets, for example brush gaskets.

In a preferred embodiment, the engagement features comprise elongate guides with a channel to receive an edge of the fabric sheet or element attached thereto.

In a particular embodiment, the at least one support element further comprises a filter, the filter being positioned so that air passing through the one or more vents is filtered. The air passing through the blind may thus be filtered, for example for pollen or particulates, such as from traffic fumes. The air flow may be increased by providing a motorised fan. The casing may be provided with a heat exchanger.

In one embodiment a roller retainer is positioned below the roller, in a spaced relation with the roller, to support the roller if it falls from its fixings.

Preferred features of the second aspect of the invention may be as described above in connection with the first aspect.

Throughout the description and claims of this specification, the words “comprise” and “contain” and variations of the words, for example “comprising” and “comprises”, mean “including but not limited to”, and do not exclude other moieties, additives, components, integers or steps.

Throughout the description and claims of this specification, the singular encompasses the plural unless the context otherwise
requires. In particular, where the indefinite article is used, the specification is to be understood as contemplating plurality as well as singularity, unless the context requires otherwise.

Other features of the present invention will become apparent from the following example. Generally speaking the invention extends to any novel one, or any novel combination, of the features disclosed in this specification (including any accompanying claims and drawings). Thus features, integers, characteristics, compounds, chemical moieties or groups described in conjunction with a particular aspect, embodiment or example of the invention are to be understood to be applicable to any other aspect, embodiment or example described herein unless incompatible therewith.

Moreover unless stated otherwise, any feature disclosed herein may be replaced by an alternative feature serving the same or a similar purpose. Preferred embodiments of the invention will now be described, by way of example only, with reference to the accompanying drawings in which:

Figure 1 is a perspective view of a roller blind of the present invention;
Figure 2 shows a detail of the roller blind of Figure 1;
Figure 3 is a cross section of the roller blind fabric;
Figure 4 is a cross section of a side guide of the roller blind;
Figure 5 is a cross section of the head box and the roller blind;
Figure 6 is a side view of the roller blind mounted in a window, with the blind open;
Figure 7 is a side view of the roller blind mounted in a window, with the blind closed;
Figure 8 is a side view of the roller blind mounted in a window sill;
Figures 9A-9D illustrate the attachment of the fabric sheet to the roller;
Figure 10 shows a detail of the attachment of the fabric
sheet to the roller;

Figure 11 is a cross section of a side guide of the roller blind provided with vents; and

Figures 12 A and B are plan and perspective views respectively of a retention bracket.

A roller blind of the present invention is illustrated in Figs 1 and 2, with Fig 2 showing the detail of an area of Fig 1.

The roller blind (10) shown in Fig 1 is fitted into a window surround, on the inside of the window (12). A head box (14) is mounted to the upper surface of the window surround by conventional means. The head box houses a roller (16), to which the fabric (18) of the blind is attached. The roller (16) is mounted to the head box at each end and is rotatable about its longitudinal axis. The mounting is conventional and will not be described in detail.

As with conventional blinds, the roller blind can be rotated to wrap the fabric around it, until all or most of the fabric is stored within the head casing and the blind ‘opened’. The blind can be ‘closed’ by pulling the end of the fabric opposite to the roller, causing the roller to rotate and allowing the fabric to unwind. The roller can also be driven by a motor or other device.

Fig 1 shows the blind in its 'closed' position, with the fabric extended. A bottom rail (20) is provided at the bottom end of the fabric (18), which may be made of for example aluminium or plastics material. This provides a handle for pulling the blind down and also provides even weight distribution on the blind fabric. The bottom rail further acts to stiffen the fabric, holding it in position against attack, additionally providing region for locking.

Fig 3 shows a cross section of the fabric used in the blind. The
fabric is a laminate, with an inner layer of Kevlar™ material (22). The layer of Kevlar™ material is tear resistant, giving security against the blind being penetrated by knives or other sharp objects.

The laminate fabric also has an insulation layer (24), made of foam and a reflective layer (26), made of metal foil. The insulation layer reduces heat loss through the blind and the reflective layer reflects UV radiation, preventing the transmission of heat through the blind. An outer layer of the laminate designed in use to be on the window side is light coloured, for example white, fabric (28) which reflects heat and light. The outer layer of the laminate designed in use to be on the room side is a patterned fabric (30), for example printed cotton. Other layers may be provided, for example a layer of ‘black out’ material. The layers of fabric around the Kevlar™ material have the additional benefit of protecting the Kevlar™ material from UV radiation which can cause degradation of the material.

In addition to the head box fitted into the top of the window surround, side guides are fixed to the sides of the window surround. The side guides are made preferably from extruded aluminium, plastic, reinforced plastic, or alternatively pressed and folded metal, fibre glass or carbon fibre. When the blind is closed, the sides of the fabric engage with the side guides (32), allowing the fabric to move along the side guides but preventing the fabric from being pulled out of the side guides. The side guides thus hold the edges of the fabric securely in place.

The side guides are elongate structures of uniform cross-section with elongate channels to receive the side edges of the fabric. Fig 4 shows a cross section of a side guide. The side guide (32) has an exterior wall (34) forming an approximately square shape. One side of the wall (36) is flat and is designed to be fixed
against the window surround, by conventional means. Holes may be provided to accommodate fixing means, such as screws. On the opposite side (38), the two ends (40,42) of the wall curve inwards to form a channel (44). Opposite the channel (44), a groove (46) is formed between two interior walls (48,50) protruding at approximately right angles from the exterior wall (34). In use, the side guides are mounted to the sides of the window surround, positioned substantially vertically, with the flat surface of the wall fixed to the window surround. The edge of the fabric is inserted into the channel, so that it runs along the groove. A ‘barbed’ edge is created in the fabric by cutting the outer layers (28,30) of the laminate (18) a distance from the edge of the fabric, the distance being smaller than the depth of the side guide. The layers of the laminate remain joined at the edge but are separated towards the cut. Once the side edges of the fabric are inserted into the channels, the cut layers of fabric form a barb (52), preventing it from being pulled out. Alternatively, a resilient edge could be added, such as a plastic or metal resilient barb which can deform to allow the fabric edge to be inserted but which prevents it from being pulled out. The sides of the fabric can be provided with any suitable means to ensure the fabric edge is held securely within the side guides.

The use of guide rails improves the security of the blind by holding it in position at the sides when it is in its ‘closed’ position. By holding the blind in position, the guide rails also reduce the light, noise, particulates and pollen which can pass around the sides of the blind.

A snug fit is created between the edges of the fabric and the side guides to reduce ingress of particulates and pollen and helps reduce noise and light passing around the edges of the blind. A snug fit is also created between the bottom rail and the sill, for example by providing a channel in the sill to receive the bottom rail. This can be further improved by the
forming of a seal between the fabric edge and the guide channel and/or between the bottom rail and the sill, for example a gasket or brush seal.

The security of the blind is further improved by providing locks to lock the blind in its closed position. The lock could be between the bottom rail and the window sill, holding the bar against the sill. Alternatively, the lock could be between the fabric (or element attached to it) and the side guide. In this case, a lock could be provided on each side. For optimal security, locks can be provided at the top and bottom of each side rail.

The head box is illustrated in more detail in Fig 5. The head box (14) has a casing (54). One side (56) has a flat surface which in use is mounted to the top of the window surround. A roller (16) is shown housed within the casing. The roller typically has integral bearings allowing it to rotate about its longitudinal axis. The roller mechanism is conventional and will not be described further, it can be either manually operated or motorised. An elongate slit (19) is provided in the casing to allow the fabric wound around the roller to exit the casing.

The head box (14) is provided with ventilation apertures, to allow air flow. This is particularly important with the use of sealed side guides which will prevent air flow around the sides of the blind. Most modern windows are provided with a ventilation panel in the top of the window frame; thus an air flow is present even when the window is closed.

Fig 5 shows two ‘inlet’ apertures (58,60) which in use are on the side of the head box adjacent the window and an ‘outlet’ aperture (62) which is located on the opposite side of the head box. A filter (64) is provided adjacent the inlet apertures (58,60), so that any air passing through the head box from the window side of the blind must pass through the filter (64). The
filter unit may also include a fan or heat recovering fan. The filter removes pollen and particulates from the air. The inlet apertures (58,60) are positioned so that, in use, they are adjacent the conventional position of window vents.

Figs 6 and 7 are side views of the blind fitted in the window, with the blind open and closed respectively. In Fig 7, arrows indicate air flow through the ventilation channels in the head box (14). As shown in Fig 7, air passing through an open window (15) or window vent (17) passes through the vents in the head case and into the room.

Fig 8 shows an alternative embodiment in which the head box is fitted into the sill of the window. The blind is closed by pulling the bottom rail upwards. In this case, a catch is provided on the top of the window surround to hold the bar when the blind is closed. In this embodiment, the roller blind may be sprung loaded, hydraulic or electric. The head box may also be mounted to a side wall of the window surround and the blind closed by pulling the bar horizontally.

Ventilation may alternatively or additionally be provided via the side guides. Fig 11 illustrates a cross section through part of a window (80) and surround, to which a side guide is mounted. Typically the window surround is a cavity wall (82) comprising a double layer of brick wall (84) with an internal cavity (86). Against this wall is the window and the internal finishing of the wall typically comprises plaster board (88). In this embodiment the side guide comprises a double profile made from pressed and folded metal, for example aluminium or steel. The inner profile (90) has the structure described with reference to Fig 4 and will not be described in any more detail. The outer profile (92) has a rectangular cross section with a hollow chamber (94) and is mounted to the inner profile and to the wall. The outer profile is provided with air vents (96) enabling ventilation. As with the embodiment shown in Fig 5, it may also
be provided with a motor, filters and heat exchangers.

The roller for use in the present invention is illustrated in Figs 9A - 9D. Fig 9A shows both a conventional roller (66) and the roller (16) according to the present invention. The conventional roller (66) is a uniform hollow cylinder, typically made of metal, plastic or cardboard, to which a fabric sheet is attached, typically by adhesive. The new roller has a more complex form which is described in more detail below.

Figs 9B to 9D show how the fabric sheet (18) is attached to the roller (16). Fig 9B is a cross sectional view of the roller (16) which has a hollow substantially cylindrical form with four longitudinal grooves (68) which extend along its length. The grooves are positioned 90 degrees apart. Each groove has a corresponding ‘locking extrusion’ (70) which are dimensioned to have a length equal to the groove (68) of the roller but with a smaller width and depth, so that it fits snugly in combination with the fabric sheet (18). The roller is made from extruded aluminium or rolled steel. It may be made from other strong materials, such as metal, strong plastics, carbon fibre or glass fibre.

Fig 9C illustrates roller (16) with the fabric sheet (18) attached. The fabric is fixed in place by pushing the locking extrusion (70) into the groove (68), sandwiching the fabric in between, and fastening it in place with a fixing screw (72). This is repeated for all four grooves (68), until the fabric is wrapped completely around the roller (16), as illustrated in Fig 9D. Fig 10 is a detailed region of the roller of Fig 9D, which shows the roller with the fabric wrapped around it. The fabric is held in position by pinching the fabric in four places. This method of fastening the fabric onto the roller provides a strong fastening, which is sufficiently strong to withstand attacks on the blind. Although the figures show four grooves, more may be provided.
The head box and side guides can be mounted in recesses in the window surround, giving a flush unobtrusive appearance. Alternatively, the head box and side guides can be surface mounted.

The head box and side guides may be fitted into the door or window itself rather than the surround. Furthermore, they may be produced integrally with the door or window (for example a uPVC door or window may be fitted with the head box and side guides during manufacture).

A point of weakness in convention blinds is the roller and winding mechanism. The roller itself is made of a material sufficiently strong not to fail under an attack, for example aluminium, steel, plastics etc. The roller may be reinforced, for example made of plastics material with metal reinforcement. The winding mechanism is often made of plastics materials. If the fabric of a conventional blind is pulled hard, for example by an intruder, there is a risk that either the roller will be pulled away from its fixing, for example caused by the winding mechanism braking.

The applicants have overcome this problem by the provision of a roller retainer. A roller retainer in the form of a retention bracket is illustrated in Figures 12A and 12B. The retention bracket 100 comprises a plate 102 for mounting onto the window surround. Apertures 104 are provided for fixings, such as screws. The bracket may be mounted indirectly onto the window surround, for example inside the head box.

A protrusion 106 extends from the plate, which in use is positioned below the roller, spaced from it. In this embodiment, the protrusion is arcuate in shape. The protrusion in Figures 12A and B is provided with a slit 108, through which the blind fabric can pass, although depending on the design of the roller
blind, this may not be necessary.

In normal use, the roller retainer has no contact with the roller. If the roller blind is attacked by forcibly pulling on the blind fabric, the roller may be pulled free from its fixings or the fixings supporting it may brake. In this case, the roller will fall downwards and be caught by the roller retainer, thus ensuring the roller is securely supported and cannot be pulled down.

The provision of such a retention bracket enables a conventional roller mechanism to be used, using easily available materials such as plastics.

Although Figures 12A and 12 B illustrate an arcuate protrusion, the protrusion may be any shape, for example two protrusions in a V-shape or two pegs. Instead of using a bracket, the head box can be designed to retain the roller if it becomes detached from its fixings.

The blind of the present invention provides enhanced security against attacks by knives or other sharp objects, projectiles such as bricks and blasts, such as bomb blasts. In the event of an attack or blast, the blind prevents debris penetrating into the room. Whilst providing the aforementioned security, the blind is aesthetically pleasing and can be used in a domestic setting. The blind additionally provides protection against flying insects, particulates and pollen and reduces the impact of noise, light and external temperature.

Although the embodiment above describes a blind for a window, the invention is also suitable for doorways. The embodiment describes mounting the blind onto a window surround but it is also suitable for mounting into a door surround or to a window or door themselves. The blind is also suitable for internal partitions, such as internal doorways, for which it has the
advantage of ease of installation.
Claims

1. A roller blind comprising:
   a roller, rotatable about its longitudinal axis;
   a sheet of flexible fabric, attached to the roller at one end;
   wherein the flexible fabric comprises a tear resistant fabric.

2. A roller blind according to claim 1 wherein the flexible fabric is capable of withstanding a blade being pulled through it.

3. A roller blind according to any one of claims 1 and 2 wherein the tear resistant fabric comprises a fabric made from fibres having a tensile strength of greater than about 2000MPa.

4. A roller blind according to claim 3 wherein the tear resistant fabric comprises a fabric made from fibres having a tensile strength of greater than about 3000MPa.

5. A roller blind according to any preceding claim wherein the tear resistant fabric comprises an aromatic polyamide (aramid) synthetic fibre.

6. A roller blind according to any preceding claim wherein the tear resistant fabric comprises a para-aramid synthetic fibre.

7. A roller blind according to any preceding claim wherein the tear resistant fabric comprises one of Kevlar\textsuperscript{TM}, Twaron\textsuperscript{TM}, Nomex\textsuperscript{TM} and Technora\textsuperscript{TM}.

8. A roller blind according to any of claims 1 to 4 wherein the tear resistant fabric comprises fibres of ultra high molecular weight polyethylene.
9. A roller blind according to any of claims 1 to 4 or 8 wherein the tear resistant fabric comprises one of Kyneema™ or Spectra™.

10. A roller blind according to any of claims 1 to 4 wherein the tear resistant fabric comprises fibres of poly(p-phenylene-2,6-benzobisoxazole).

11. A roller blind according to any one of claims 1 to 4 wherein the tear resistant fabric comprises one of Vectra™, Dyneema™, Zylon™ and Cuben Fibre™.

12. A roller blind according to any of preceding claim wherein the tear resistant fabric comprises a knitted or woven fabric.

13. A roller blind according to any of claims 1 to 11 wherein the tear resistant fabric comprises a non woven fabric.

14. A roller blind according to any of claims 1 to 4 wherein the tear resistant fabric comprises a metallic mesh.

15. A roller blind according to any preceding claim wherein the tear resistant fabric comprises a laminate.

16. A roller blind according to claim 15 wherein the laminate structure comprises one or more layers of tear resistant fabric and one or more layers of a material having a property of at least one of reflection and thermal and/or noise insulation.

17. A roller blind according to any of claims 15 and 16 wherein the laminate structure comprises tear resistant fabric comprises two or more layers of woven tear resistant fabric, said two or more layers having different weave directions.

18. A roller blind according to any of claims 14 to 16 wherein the laminate structure comprises two or more layers of tear
resistant fabric of different material.

19. A roller blind according to any one of the preceding claims wherein the roller blind further comprise guides for mounting on the door, window or surround.

20. A roller blind according to claim 19 wherein the edges of the flexible sheet are provided with engagement features for engaging with the guides.

21. A roller blind according to any preceding claim wherein the end of the flexible sheet opposite the roller has a bar mounted thereto.

22. A roller blind according to any preceding claim wherein one or more securing devices are provided to secure the roller blind in an extended position.

23. A roller blind according to claim 22 wherein one or more securing devices comprises first and second inter-engageable securing components, the first securing component mountable on the sheet of flexible fabric or an element mounted thereto and the second securing component mountable to a door, window or surround or an element mounted thereto.

24. A roller blind according to any one of claims 22 or 23 wherein the securing device is inaccessible from the door or window side of the blind when fitted in a door or window surround.

25. A roller blind according to claim 23, wherein the end of the flexible sheet opposite the roller has a bar mounted thereto and the first securing component is mounted on the bar.

26. A roller blind according to any one of claims 22 to 25, wherein one or more securing devices are provided towards the
free end of the flexible sheet opposite from the roller.

27. A roller blind according to claim 26 wherein said one or more securing devices comprises two securing devices, on opposite sides of the flexible sheet.

28. A roller blind according to any of claims 22 to 25 wherein one or more securing devices are provided towards the end of the flexible sheet attached to the roller.

29. A roller blind according to claim 28 wherein said one or more securing devices comprises two securing devices, on opposite sides of the flexible sheet.

30. A roller blind according to any preceding claim wherein the roller blind is provided with a drive mechanism.

31. A roller blind according to claim 30 wherein the drive mechanism is used to lock the roller blind in place.

32. A roller blind according to any one of the preceding claims further comprising guides for mounting on the door, window or surround and wherein edges of the flexible sheet are provided with engagement features for engaging with the guides.

33. A roller blind according to any one of the preceding claims further comprising a roller retainer positioned below the roller, in a spaced relation with the roller, to support the roller if it falls from its fixings.

34. A roller blind comprising:
   a roller, rotatable about its longitudinal axis;
   a sheet of flexible fabric, attached to the roller at one end;
   at least one mounting element, which in use is mounted to a door, window or surround and which in use is engageable with the
roller, fabric or an element mounted thereon;
wherein the at least one mounting element is provided with one or more air vents.

35. A roller blind according to claim 34 wherein the at least one mounting element comprises a casing for housing the roller.

36. A roller blind according to any of claims 34 or 35, wherein the at least one mounting element comprises engagement features mountable onto a door, window or surround into which edges of the flexible material or elements mounted thereto engages when it is extended.

36. A roller blind according to claim 35 comprising a seal between the engagement features and the fabric sheet or elements mounted thereto.

37. A roller blind according to any one of claims 33 to 36 wherein the engagement feature comprises an elongate guide with a channel to receive an edge of the fabric sheet or element attached thereto.

38. A roller blind according to any of claims 34 to 38 wherein the mounting element further comprises one or more filters.

40. A roller blind according to any one of claims 34 to 39 wherein the mounting element further comprises a motorised fan.

41. A roller blind according to any one of claims 34 to 40, wherein the mounting element is provided with a heat exchanger.

42. A roller blind substantially as herein described with reference to the accompanying illustrative drawings.
Patents Act 1977: Search Report under Section 17

Documents considered to be relevant:

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<td>X,Y</td>
<td>X: 1, 2, 19-29, 32 Y: 33</td>
<td>GB874711 A (CARLIGHT), see whole document.</td>
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<td>US6286579 B1 (GOTTSCHALK), see Abstract, Figures, Col. 4 lines 29-44.</td>
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<td>US4317480 A (PHELPS), see Abstract and Figures.</td>
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<td>Document indicating lack of novelty or inventive step.</td>
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**Field of Search:**
Search of GB, EP, WO & US patent documents classified in the following areas of the UKC:

| Worldwide search of patent documents classified in the following areas of the IPC |
| A47H; D04H; E06B |

The following online and other databases have been used in the preparation of this search report:

| EPODOC, WPI |

**International Classification:**

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