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(54) A THERMAL CURTAIN

(57) The invention relates to a retractable thermal curtain for a thoroughfare. The thermal curtain has an open position wherein the curtain is retracted to at least one side and a closed position wherein the curtain extends into at least part of the thoroughfare. The thermal curtain comprises a plurality of strips of polyvinyl chloride extending from a top holding member and each top holding member is connected to a roller connector. Adjacent roller connectors are linked and wherein adjacent top holding members linked. The invention extends to a curtain arrangement wherein the curtain is connected to a rail.

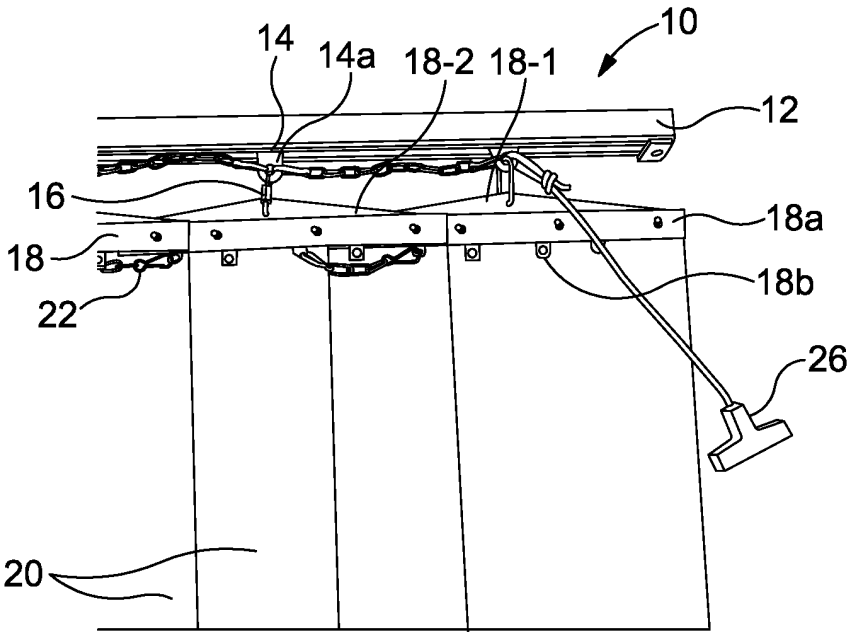


Fig. 1

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Description

Field of the Invention

[0001] This invention relates to an improved thermal curtain, especially for use in thoroughfares and doorways.

Background to the Invention

[0002] Thermal curtains are intended to provide a barrier between two locations in order to retain heat on at least one side of the curtain and they also reduce noise. The curtains are often transparent or translucent to allow a person to see if someone is approaching the curtain from the other side.

[0003] Existing systems often involve a frame that is equal to, or larger than, the thoroughfare that is to be covered and lengths of material are fixed to the frame. To retract the curtain, the frame is moved sideways, thereby moving the lengths of material out of the thoroughfare. A problem with such an arrangement is that one must have a space to the side of the thoroughfare that is at least the same width as the thoroughfare. This is not always possible and so the curtain cannot be fitted.

[0004] Alternatively, a retractable curtain may be used in which rollers of a curtain may be connected to adjacent rollers. Whilst this allows the curtain to be readily opened and retracted, the rollers may become twisted in pulling the curtain, which can lead to the curtain jamming or for an increase in friction, thereby making it more difficult to operate the curtain. Where the curtain becomes jammed, a user will often not close it properly, which results in a loss of heat and an increase in heating costs. The same result can occur when the rollers suffer from fatigue and so break with the twisting.

Summary of the Invention

[0005] Accordingly, the present invention is directed to a retractable thermal curtain for a thoroughfare, the thermal curtain having an open position wherein the curtain is retracted to at least one side and a closed position wherein the curtain extends into at least part of the thoroughfare, wherein the thermal curtain comprises a plurality of strips of polyvinyl chloride extending from a top holding member and each top holding member is connected to a roller connector, wherein adjacent roller connectors are linked and wherein adjacent top holding members linked.

[0006] In a closed position the strips are aligned substantially parallel, or close thereto, with one another and with the rail to which they may be connected. This ensures that they overlap and so provided a thermal and acoustic barrier with no significant gaps in the thoroughfare.

[0007] The curtain may comprise one length of joined top holding members and associated strips, or it may comprise a plurality of lengths. For example, the curtain may comprise two portions, each extending from an end to the centre, in a closed position, thereby having a centre parting. Alternatively, it may be desirable to have one section extending to a third of the way across the thoroughfare and the other section extending the rest of the way across the thoroughfare.

[0008] Preferably, the link between the rollers comprises a chain, wire, cable or cord. Where the rollers are linked by a connecting mechanism the rollers assist with pulling their adjacent roller, which in turn results in a smooth movement as the curtain opens and closes.

[0009] Advantageously, in the closed position, adjacent polyvinyl strips overlap one another. When the curtain is drawn and so is positioned within the thoroughfare, it is advantageous that the polyvinyl strips overlaps one another to reduce the passageway for the through flow of air and heat.

[0010] It is further advantageous that the adjacent polyvinyl strips overlap by up to one half of their width and preferably, the polyvinyl strips overlap by up to one third of their width. This provides a good amount of overlap to reduce the risk of heat and air passing through the curtain when in a closed position. Additionally, it makes drawing the curtain easier because adjacent strips do not catch one another and make movement of the curtain more difficult.

[0011] It is preferable that adjacent top holding members overlap when in the closed position. The overlapping holding members reduce the risk of the strips blocking one another when the curtain is drawn open or closed and allows for a smoother operation of the curtain. The overlapping of the holding members also encourages overlapping of the polyvinyl strips.

[0012] In one embodiment, the thermal curtain comprises a first top holding member, which is closer to the lead edge of the thermal curtain than a second top holding member, and wherein the sides of the first top member and the adjacent second top holding member that face one another are linked. Linking facing sides of the device stops the strips from becoming twisted and tangling. Additionally, the linkage allows for a smooth opening and closing of the curtain by allowing a lead holding member to pull the next holding member so that the curtain moves in a predictable and controlled manner. Additionally, it reduces the risk of the holding members interfering with one another and preventing the curtain from opening and closing effectively.

[0013] Preferably, the link between the first top holding member and the second top holding member is positioned in the rear half of the first top holding member and the position of the link on the second top holding member is positioned in the front half of the second top holding member, and more preferably, the link between the first top holding member and the second top holding member is positioned in the rear third of the first top holding member. By positioning the link on in the rear half of the first holding member and the front half of the second holding

member, the holding members are able to pull one another back and forth and maintain a good overlap to retain an effective thermal barrier.

[0014] Advantageously, in an open position, the thermal curtain takes up less than a third of the width of the thoroughfare. By overlapping the holding members and the strips, the curtain can be retracted to less than a third of the width of the thoroughfare, thereby allowing a large area for the passage of people and/or vehicles when in a retracted position.

[0015] It is preferable that, when in an open position, the curtain does not extend outside thoroughfare when in an open position. This allows the curtain to be contained within the thoroughfare when open and so is especially useful in particularly restricted locations, where there is little or no space to the side of the thoroughfare. Additionally, where switches are positioned adjacent the curtain this allows access to them rather than obscuring the switches with the curtain.

[0016] In an advantageous embodiment, the top holding members are connected to the roller connectors such that they can at least partially rotate relative to the roller connectors. By providing a rotational link between the roller connectors and the top holding members, the holding members, and associated strips, may be rotated to avoid them interfering with one another and to allow them to be stowed at an angle away from perpendicular with the rail to which they're connected.

[0017] In a preferable embodiment, an end roller connector is provided with a handle for pulling the curtain between the open position and the closed position. Where the curtain comprises more than one section, each section may be provided with a handle. Whilst one may position a handle along the length of the curtain, it is most desirable to have it at one end.

[0018] The invention extends to a retractable thermal curtain arrangement, wherein the arrangement comprises a thermal curtain as herein described and a rail that is engaged by the roller connectors of the thermal curtain.

[0019] Preferably, the arrangement comprises two retractable curtains connected to a single rail and arranged so as to each extend into the thoroughfare when in a closed position. This is particularly advantageous where it may be required to have one side of the curtain open whilst the other side remains in place. A centre parting, or off-centre parting, having two curtains may be required for particular applications.

Brief Description of the Figures

[0020] An embodiment of the invention will now be described, by way of example only, and with reference to the accompanying drawings, in which:

Figure 1 is an image of a curtain in accordance with the present invention;
Figure 2 is an image of a second view of the curtain of Figure 1;
Figure 3 is a further image of the curtain of Figure 1;
Figure 4 is a view of the curtain of Figure 1 in a retracted position; and
Figure 5 is a second view of the curtain of Figure 1 in a retracted position.

Detailed Description of Exemplary Embodiment

[0021] Figures 1 to 5 show a curtain arrangement 10 comprising a rail 12 into which rollers 14 are positioned. The rollers 14 engage the rail 12 and are able to roll along the rail. The rollers are provided with extensions 14a comprising apertures, through which are attached connectors 16 and the connectors 16 also engage top holding members 18 through apertures in the top holding members 18. The top holding members 18 comprise metal plates that are divergently tapered from the top section and are provided with a lower holding end 18a. The top holding members 18 are further provided with link apertures 18b along the lower part of the holding end 18a. The link apertures 18b comprise a flange with an aperture therein.

[0022] Polyvinyl chloride (PVC) strips 20 are connected to each top holding member 18 along the lower holding end 18a. The PVC strips 20 extend away from the top holding members 18 in an intended downward direction and they may be attached to the top holding member 18 using protrusions in the strips 20 and corresponding apertures in the top holding members 18 that accept and retain the strips 20.

[0023] Adjacent top holding members 18 are linked to one another by a chain link 22. The chain link 22 connects a first link aperture 18b on one side of a first top holding member 18-1 in its intended rear half, to a link aperture 18b on the side of a second top holding member 18-2 facing the first top holding member 18-1 in its intended lead, or front, half. The link apertures 18b may be in the rear third of the first top holding member 18-1 and the front third of the second top holding member 18-2.

[0024] Adjacent roller connectors 14 are also linked by a chain 24, which extends between the adjacent roller extensions 14a. The lead roller extension 14a, that is to say, the extension 14a of the end roller that is the closest to the end of the rail 12 is provided with a handle 26. The roller 14a at the other end of the curtain arrangement 10 may be affixed to the end of the rail 12 to prevent it being moved. This may be via a chain or other connection means.

[0025] In a retracted position at one end of the rail 12, as shown in Figures 4 and 5, which illustrate that the strips 20 may be orientated substantially parallel with the rail 12 or substantially perpendicularly thereto, a user pulls the handle 26 towards to extend the curtain across the rail, thereby 'closing' the curtain 10 and positioning it across a thoroughfare. The due to the links between the rollers 14 via chains 24 and the PVC strips 20 via chains 22, the adjacent rollers 14 and strips 20 are pulled along the rail 12. Due to the chains 22 and 24, the likelihood of the rollers 14 twisting and jamming in the rail is

reduced as the connections allow the strips to be aligned to reduce twisting. Additionally, with the connectors 16 being able to rotate to some degree within the roller extension, the rotation forces on the roller 14 are reduced. Where the strips 20 are stored substantially perpendicular to the rail 12, they are rotated upon the rollers extending across the rail to rotate to be substantially parallel therewith. The strips 20 overlap by around a quarter of their width, which creates an acoustic and thermal barrier to reduce the passage of heat and sound through the curtain 10.

[0026] When retracted to an open position, the handle 26 is pulled towards the rear of the curtain 10 and the rollers 14 allow a smooth retraction of the curtain 10. Again, the chain connections 22 and 24 reduce rotation on the rollers 14 and thus allow the curtain to roller smoothly along the rail 12.

[0027] It will be appreciated that other shapes for the holding members may be used according to the requirements. Furthermore, other materials, for example plastics materials, may also be used for the top holding members.

[0028] The PVC strips may be clamped onto the top holding members or attached thereto in another convenient manner.

[0029] The PVC strips may be orientated in any preferred angle when the curtain is retracted by adjusting the connection between the top roller and the PVC strips to allow a particular rotation. The chains connected the PVC strips will be adjusted accordingly to assist in the rotation.

[0030] The amount of overlap between adjacent PVC strips may be adjusted as required between 10% overlap and 70% overlap.

Claims

1. A retractable thermal curtain for a thoroughfare, the thermal curtain having an open position wherein the curtain is retracted to at least one side and a closed position wherein the curtain extends into at least part of the thoroughfare, wherein the thermal curtain comprises a plurality of strips of polyvinyl chloride extending from a top holding member and each top holding member is connected to a roller connector, wherein adjacent roller connectors are linked and wherein adjacent top holding members linked.

2. A thermal curtain according to claim 1, wherein the link between the rollers comprises a chain, wire, cable or cord.

3. A thermal curtain according to claim 1 or claim 2, wherein, in the closed position, adjacent polyvinyl strips overlap one another.

4. A thermal curtain according to claim 3, wherein the adjacent polyvinyl strips overlap by up to one half of their width.

5. A thermal curtain according to claim 4, wherein the polyvinyl strips overlap by up to one third of their width.

6. A thermal curtain according to any one of claims 3 to 5, wherein adjacent top holding members overlap when in the closed position.

7. A thermal curtain according to any preceding claim, wherein the thermal curtain comprises a first top holding member, which is closer to the lead edge of the thermal curtain than a second top holding member, and wherein the sides of the first top member and the adjacent second top holding member that face one another are linked.

8. A thermal curtain according to claim 6, wherein the link between the first top holding member and the second top holding member is positioned in the rear half of the first top holding member and the position of the link on the second top holding member is positioned in the front half of the second top holding member.

9. A thermal curtain according to claim 8, wherein the link between the first top holding member and the second top holding member is positioned in the rear third of the first top holding member.

10. A thermal curtain according to any preceding claim, wherein, in an open position, the thermal curtain takes up less than 30% of the width of the thoroughfare.

11. A thermal curtain according to any preceding claim, wherein, when in an open position, the curtain does not extend outside thoroughfare when in an open position.

12. A thermal curtain according to any preceding claim, wherein the top holding members are connected to the roller connectors such that they can at least partially rotate relative to the roller connectors.

13. A thermal curtain according to any preceding claim, wherein an end roller connector is provided with a handle for pulling the curtain between the open position and the closed position.

14. A retractable thermal curtain arrangement, wherein the arrangement comprises a thermal curtain according to any preceding claim and a rail that is engaged by the roller connectors of the thermal curtain.

15. A retractable thermal curtain arrangement according

to claim 14, wherein the arrangement comprises two retractable curtains connected to a single rail and arranged so as to each extend into the thoroughfare when in a closed position.

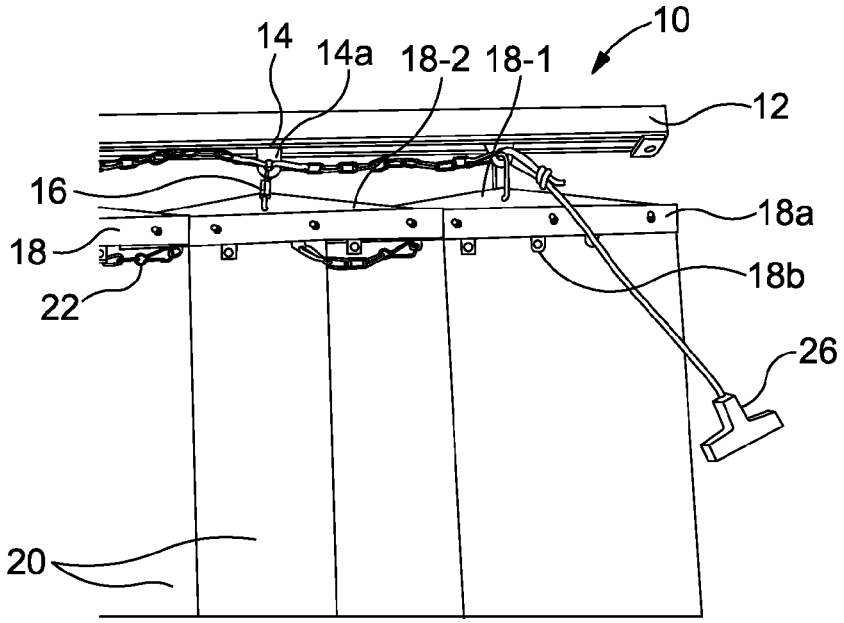


Fig. 1

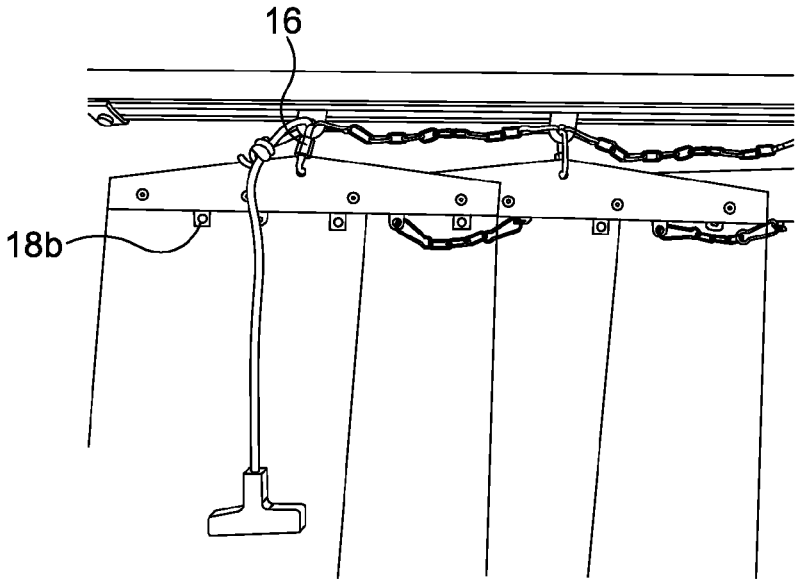


Fig. 2

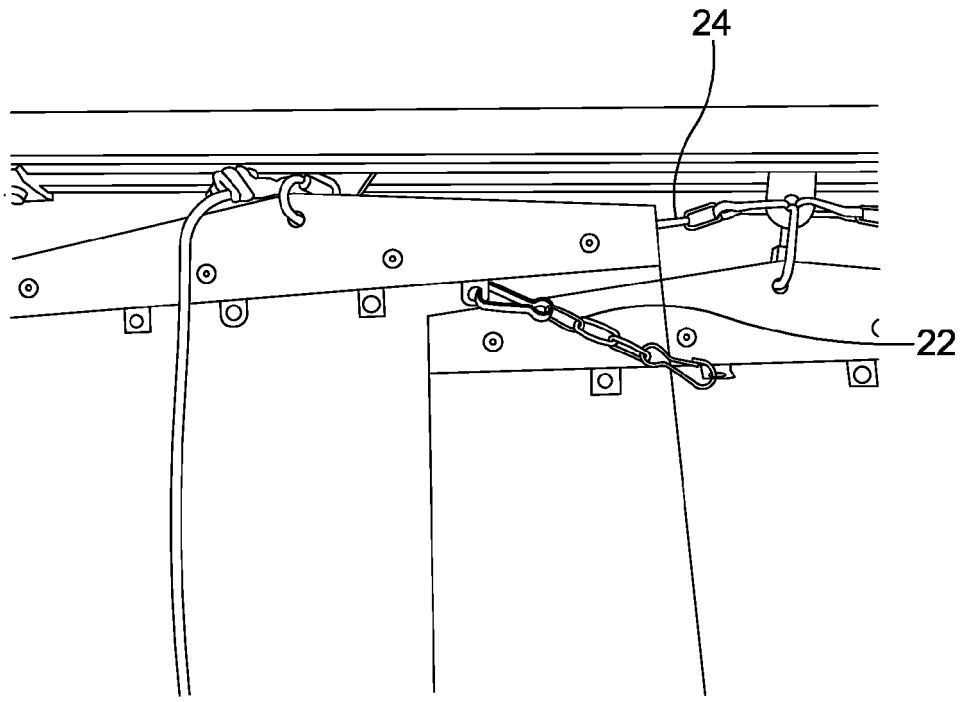


Fig. 3

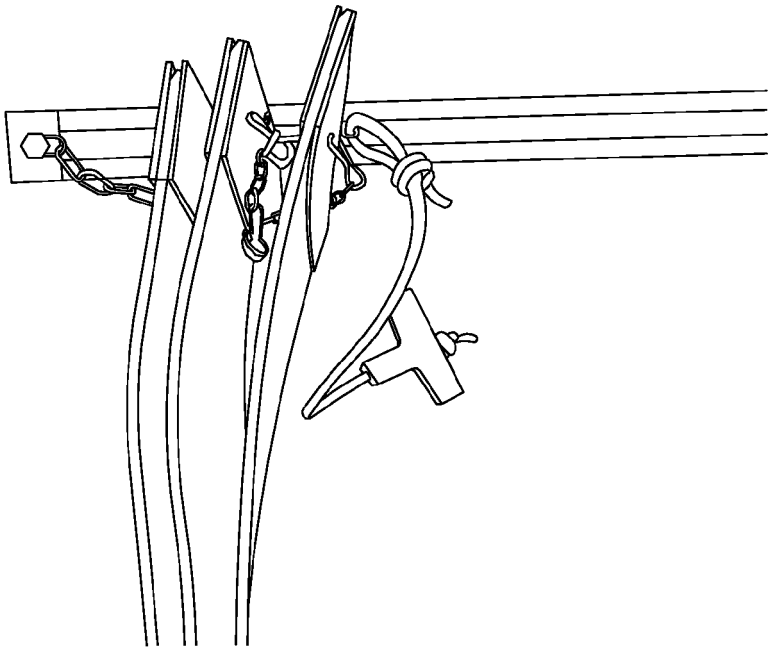


Fig. 4

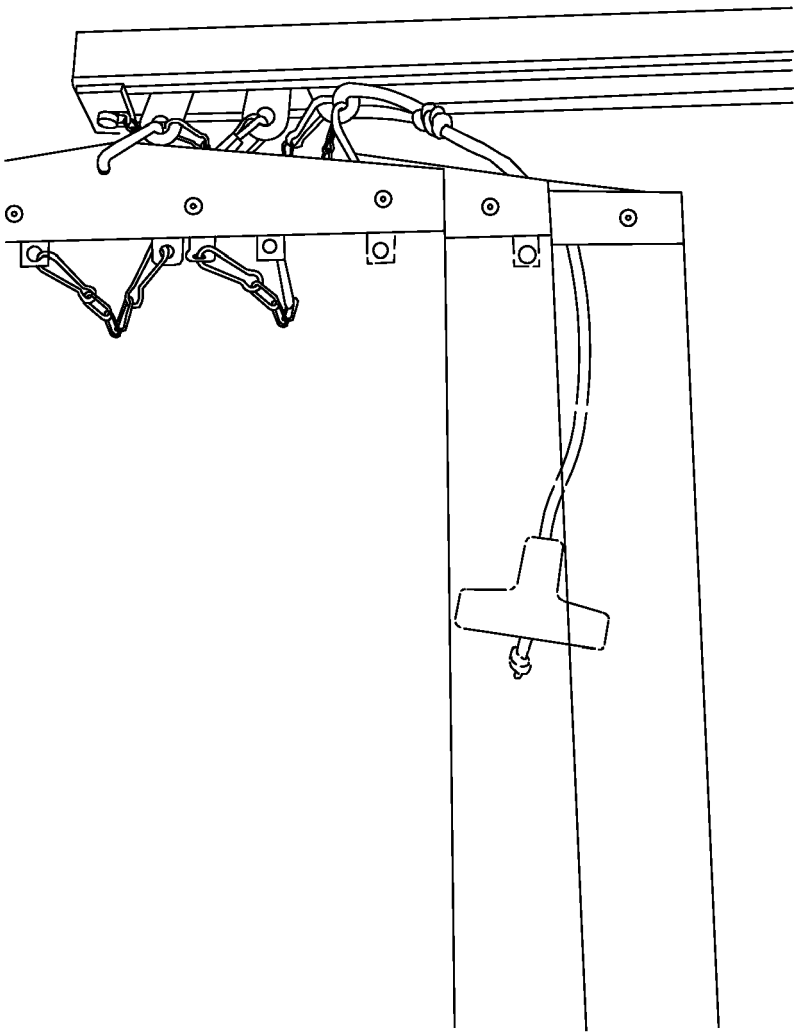


Fig. 5

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EUROPEAN SEARCH REPORT

Application Number
EP 15 16 3673

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	DE 10 2004 045015 A1 (TREND GARDINEN & ZUBEHOERFABRI [DE]) 16 March 2006 (2006-03-16) * the whole document *	1-15	INV. E06B3/80
Y	US 5 143 137 A (WEST FLOYD D [US]) 1 September 1992 (1992-09-01) * figures 1-5 * * column 1, lines 7-29 * * column 3, line 59 - column 6, line 61 * * column 8, line 64 - column 9, line 3 *	1-15	
Y	US 1 841 065 A (SIMON LESTER S) 12 January 1932 (1932-01-12) * figures 1-2 *	1-15	
A	GB 2 080 379 A (SILLS GEOFFREY ALAN) 3 February 1982 (1982-02-03) * figures 1-4 * * page 1, lines 3-124 *	1-15	
			TECHNICAL FIELDS SEARCHED (IPC) E06B A47F

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	14 August 2015	Blancquaert, Katleen

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 15 16 3673

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
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14-08-2015

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