PARTITION APPARATUS AND SYSTEM

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ABSTRACT

An extendable rod has a head that captures a partition curtain and holds the curtain near a surface such as a ceiling or wall. The head has an outer surface (e.g., an upper surface when the head is abutting a ceiling) that has a deformable gripping surface. The lower surface of the head is metallic and relies upon magnetic force to capture the curtain in place on the head. In a first embodiment the lower surface has downwardly depending flanges on opposite ends. The curtain is draped over the upper surface of the head and is wrapped over the lower surface. A magnet or magnets are placed onto the lower surface, inward of the flange, capturing the curtain and holding it in place on the head. The rod is then extended so that the upper surface of the head bears against the ceiling or other surface. The magnets hold the curtain securely in place, which allows for simple installation.
PARTITION APPARATUS AND SYSTEM

FIELD OF THE INVENTION

This invention relates to apparatus used to create partitions in rooms and the like, and more particularly, to a partition rod system that fixes partition curtains or walls in place.

BACKGROUND

Temporary partitions are often used to isolate or separate portions of a building or room. Temporary partitions act as a barrier to dust, odors, noise and the like are often used in new construction and remodeling. For example, home remodeling generally generates dust, noise and odors such as those from paint. In order to minimize intrusion of dust and the like into areas of the home that are not being remodeled, temporary partitions may be used to isolate work areas. Temporary partitions similarly are found useful in many different environments.

There are many different types and styles of partitions, ranging from a simple plastic sheet fastened to a ceiling with nails, to relatively sophisticated commercially available systems that include spring-loaded extendable poles that hold the curtain material in place. Partitions typically include a barrier material or curtain, which is a plastic sheet that is extended between parts of a room that are to be separated from another part of the room. Partitions may extend from floor-to-ceiling and wall-to-wall, and anything in between. The curtain or partition acts as a barrier to dust, noise, light, etc., and may include openings to allow workers to pass from one side of the partition to another. Partitions are useful during construction to isolate a clean area from a work area and to thereby protect the clean area from contamination. As one example, an area that is being painted may be isolated from other parts of the room that are already finished.

It is important that wherever a partition is used, it is easy to set up and take down, and provides an effective barrier. In order to provide an effective barrier, the barrier material must seal as effectively as possible to the wall to which it is attached. Some commercially available partition systems require either a ladder or step stool to properly install the pole between the ceiling and floor. Other available systems are not capable of capturing the curtain material securely enough to the head to prevent the curtain from inadvertently becoming detached from the head, in which case the partition falls down. Still other systems are not capable of exerting enough pressure between the floor and ceiling to insure that the pole stays in place, especially when bumped by a worker or some equipment.

Although there are many different partition systems available, there is a need for temporary partition systems that accomplish these goals simply and effectively and which overcome the limitations of currently available devices and systems.

SUMMARY OF THE INVENTION

A first illustrated embodiment of the present invention comprises an extendable rod having a pivotal head with an upper surface that captures the partition curtain material between the head and a surface such as a ceiling or wall. The head has an outer surface (e.g., an upper surface when the head is abutting a ceiling) that has a rubber gripping surface. The lower surface of the head is metallic and has downwardly depending flanges on opposite ends. The curtain is draped over the upper surface of the head and is wrapped over the lower surface. A magnet or magnets are placed onto the lower metallic surface, inward of the flange, capturing the curtain and holding it in place on the head. The head is then extended so that the upper surface bears against the ceiling. The magnets hold the curtain securely in place, which allows for simple installation, and because the curtain is actually pressed against the ceiling, the partition is effectively free of openings and thus acts as an efficient barrier.

A second illustrated embodiment utilizes a different head and a different structure for capturing the curtain in the head, yet relies upon a magnet attached to a metallic plate to retain the curtain to the head, and provides the same effective seal between the barrier material and the ceiling or wall.

BRIEF DESCRIPTION OF THE DRAWINGS

The invention will be better understood and its numerous objects and advantages will be apparent by reference to the following detailed description of the invention when taken in conjunction with the following drawings.

FIG. 1 is a perspective view of a first embodiment of the upper portion of a partition rod illustrating the head from the lower side, pressing a curtain against a ceiling.

FIG. 2 is a cross sectional view taken along the line 2-2 of FIG. 1.

FIG. 3 is a perspective view of a first embodiment of the upper portion of a partition rod illustrating the head from the lower side, pressing a curtain against a ceiling similar to the view of FIG. 1, but showing the apparatus installed immediately along the length of a curtain.

FIG. 4 is a cross sectional view taken along the line 4-4 of FIG. 3.

FIG. 5 is a lower perspective view illustrating the use of a magnet to secure the curtain (illustrated as a clear plastic sheet) to the head, and illustrating the foot of the apparatus.

FIG. 6 is a first alternative embodiment, shown in lower perspective view.

FIG. 7 is cross sectional view taken along the line 5-5 of FIG. 6.

FIG. 8 is a perspective, partially exploded view of the embodiment of FIG. 5, illustrating assembly of the head portion of the partition pole with the curtain, which again is shown as a clear plastic sheet.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

A partition apparatus 10 according to the present invention is shown in the attached drawings. The apparatus generally comprises a partition rod 12 having a head 14 on one end, a foot 16 on the opposite end (see FIG. 5), and an extension/retraction apparatus, shown generally at 18, positioned along rod 12 intermediate between the head and the foot. Extension/retraction apparatus 18 is preferably located toward the head 14, but at a position that will be easily accessible by most workers.

With reference to the drawings, the upper portion of the partition rod 12 is shown in all of the figures; FIG. 5 illustrates the foot 16. It will be appreciated that the foot 16 is typically placed against the floor (at least where the partition rod extends from floor to ceiling to make a partition wall) and the head 14 is placed against the ceiling. Just as well, foot 16
may be placed against one wall and head 14 placed against an opposing wall when rod 12 is being used to span between walls. As a naming convention, relative directional terms used herein are made with reference to a typical room; “upper” refers to the direction toward the ceiling; “lower” refers to the direction toward the floor, and so on.

[0019] Typically, a partition curtain will require at least two apparatuses 10, one near each lateral end 69 of the partition. For example, if the partition extends from wall to wall, floor to ceiling, then an apparatus 10 will be necessary near each wall. FIGS. 1 and 2 illustrate apparatus 10 assembled with a curtain where the apparatus is being placed near a lateral end 69 of the partition. Where the partition spans a significant distance from wall to wall, apparatus(es) 10 may be necessary in intermediate positions between the two opposite ends of the curtain. FIGS. 3, 4 and 5 illustrate apparatus 10 assembled with a curtain in such intermediate positions.

[0020] It will be understood that the length of the partition rod may be adjusted to span a variety of lengths (for instance, different floor to ceiling distances, different wall to wall spans). As detailed below, extension/retraction apparatus 18 provides for some amount of extension and retraction of the head 14 from the rod 12. However, it is desirable for the overall length of rod 12 to be varied significantly so that apparatus 10 may be used in a variety of circumstances, and where the span between head 14 and foot 16 may vary widely. Accordingly, in addition to extension/retraction apparatus 18, rod 12 may include telescoping extension capability or other conventional structures that allow the length of the rod to be increased and decreased easily.

[0021] As noted, extension/retraction apparatus 18 is attached to an end 20 of the rod 12 opposite foot 16. In the illustrated embodiments, the extension/retraction apparatus 18 comprises a handle 32 that is mechanically and pivotally attached to base 24 to drive a shaft 26 outwardly away from the rod 12 to thereby increase the overall length of the apparatus 10. Base 24 includes a cylindrical end 26 that is sized to be received over end 20 of rod 12. Extension/retraction apparatus 18 is preferably attached to the end 20 of rod 12 with a fastener such as rivet 28, but may be fastened with a screw so that the extension/retraction apparatus may be easily removed from the rod. A spring-loaded plunger assembly 30 is housed in the upper end of base 24—that is, the end of base 24 opposite cylindrical end 26. Briefly described, plunger assembly 30 is operable with handle 32, which pivots in the manner shown in FIG. 1 at arrow A, to drive shaft 26 outwardly in the direction shown by arrow B, thereby effecting increasing the length of apparatus 10 by moving head 14 away from rod 12. Shaft 26 is an elongate metallic piece that extends into the hollow core of rod 12, thereby allowing the effective length of apparatus 10 to be increased substantially if desired. When pivoted toward rod 12, handle 32 operates to pivot a first dog 34, through which shaft 26 extends, in the direction of arrow B, against the force of a first spring 36 which encircles shaft 26. As first dog 34 pivots it binds on shaft 26 and thereby drives it outwardly, away from the handle. When handle 32 is released and thus pivoted away from rod 12, the shaft 26 is retained in the position into which it was driven by first dog 34 as it binds the shaft. By repetitive squeezing of handle 32, shaft 26 and thus head 14 may be driven outwardly away from apparatus 18. The length of shaft 26 limits the distance that head 14 may be extended away from extension/retraction apparatus 18. As noted above, rod 12 may be fitted with a telescoping mechanism to allow the overall length of the rod to be changed. Typically, shaft 26 will be from 12 to 18 inches in length, which allows the head to be urged against the ceiling or wall when the partition is assembled as detailed below. Importantly, the extension/retraction apparatus 18 described herein and as shown in the drawings uses a ratcheting mechanism that is capable of exerting substantial pressure between the foot (on the floor) and the head (when it bears against a ceiling). For example, as detailed below the pressure applied to head 14 may be up to about 40 psi or more.

[0022] Apparatus 18 likewise includes a mechanism to retract shaft 26. Specifically, a second dog 38 through which shaft 26 extends, and second spring 40. Dog 38 includes an extended portion 40 which functions as a release button. By pressing the extended portion 40 of dog 38, shaft 26 is released and may be retracted into rod 12, thereby decreasing the effective length of apparatus 10.

[0023] The extension/retraction assembly 18 illustrated herein is typical of the handle-driven shaft used in a caulk gun, such as the apparatus described in U.S. Pat. No. 6,155,463, which is assigned to the assignee of the present application and the disclosure of which is incorporated herein by this reference. It will be appreciated that there are other equivalent mechanisms well known to those of skill in the art that may be attached to rod 12 to enable head 14 to be driven away from the end of the rod and thus increase the overall length thereof. It will also be appreciated that the extension/retraction apparatus may be omitted from apparatus 10, in which case the length of rod 12 may be changed with a simple and conventional telescoping mechanism.

[0024] With reference to FIG. 5, a rubber foot 42 is preferably attached to the foot 16 of rod 12, opposite end 20.

[0025] The head 14 illustrated in the embodiments of FIGS. 1-6 defines a mount for capturing a partition curtain and retaining the curtain in a desired location relative to a surface such as a ceiling or wall. Head 14 comprises a metallic plate 50 that is pivotally attached to the upper or distal end of shaft 26 with a rivet or bolt 44 that extends through openings formed in tabs 46, 48 that depend from plate 50. Washers such as nylon washers 45 may be added interiorly of tabs 46, 48 so that the head is readily pivotable about bolt 44. The head 14 illustrated in FIGS. 1 through 6 is rectangular in shape, but it will be understood that the head may formed be in other shapes as well.

[0026] An opening is formed through the end of the shaft and the bolt passes through the opening in the shaft. The plate 50 includes opposed, downwardly depending metallic retaining flanges 52 and 54 located near the outer edges of the plate. Head 14 further comprises a deformable pad 56, such as rubber or silicone, which is placed over the upper surface 58 of plate 50 so that the upper surface 57 of the pad 56 defines the surface of the head that bears against the ceiling or wall, as detailed below. With reference to the cross sectional illustration of FIG. 2, pad 56 is formed with a lip 62 that extends around the lower peripheral edge of the pad, and which defines a peripheral groove 64 into which the periphery of plate 50 is accepted when the pad is assembled onto the plate. This retains pad 56 securely on plate 50. In all normal uses of apparatus 10 shown in FIGS. 1 through 6, pad 56 remains secured to plate 50. However, because the pad is deformable it may be removed from head 14 for cleaning.

[0027] It will be appreciated that in order to assemble a partition, typically at least two and more typically three or more of the rods described above as comprising partition
apparatus 10 are used in combination with a curtain material such as a polyethylene sheet 30 to create a temporary wall.

With continuing reference to FIGS. 1 and 2, to assemble a partition wall using apparatus 10, a curtain 68 (shown herein as a clear sheet of material such as plastic) is draped over the head 14 and is wrapped around the lower side of the head 14 so that the curtain 68 extends under the head. As noted above, in FIGS. 1 and 2 the head 14 is being assembled in a position near the lateral edge 69 of the curtain material. Apparatuses 10 installed, symmetrically between the edges of curtain 68, are assembled in the manner illustrated especially well in FIG. 5 with the dashed line and arrow A.

[0028] In either case, a strong magnet 32, preferably rectangular in shape as shown, is then attached to the lower surface of the plate 50 between the downwardly depending flange 54 and tab 48, as illustrated in FIG. 1 and as shown with dashed line and arrow B in FIG. 5, thereby firmly capturing the curtain 68 between the magnet 66 and plate 50 and securely attaching the curtain to the head 14. Flange 54 is angularly disposed relative to the lower surface of plate 50 such that the flange is at about a 90° angle relative to the surface. Magnet 66 preferably is placed so that the magnet lies adjacent to flange 54 as illustrated in FIG. 1. In this position the flange acts as a shoulder that helps retain the magnet in place. Furthermore, since flange 54 is metallic, and preferably an integral piece of plate 50, one surface of the magnet is attracted is attached to the lower surface of the plate, and an adjacent surface of the magnet is magnetically attached to the flange. As shown in the figures, the curtain material lies between magnet 66, plate 50 and flange 54. The magnet 32 is attached to the plate by virtue of the magnetic attraction between the magnet and the plate at two separate points of attachment—that is, the plate and the flange. This dual-attachment system, with the curtain captured between the magnet and the plate at both points, provides a highly secure attachment between the head 14 and the curtain 68. This highly secure, two-point attachment allows the apparatus 10 to be assembled at floor level and the assembly to be raised and installed without the risk that the curtain will become disengaged from the head. While only one magnet 66 is shown in FIGS. 1 through 5, it will be appreciated that a second magnet may be used identically at the other end of head 14, adjacent flange 52. With either one or preferably two magnets used to attach the curtain to the plate, relative movement between the plate and the curtain is eliminated.

[0029] The material used for curtain 68 is preferably relatively thin so that the magnet 66 is tightly attracted to plate 50. In most instances, as noted, a polyethylene sheet may be used for curtain 68. However, many other types of material may be used for curtain 68, including fabrics and the like so long as the force of the magnet allows the magnet to be adequately attracted to the plate so that the magnet securely captures the curtain between the magnet and the plate.

[0030] The curtain 68 may be attached to head 14 in the manner just described with magnets 66 at floor level, prior to assembly of the partition wall. Typically, the curtain 68 is laid out in the desired position, and for the purposes of this example the curtain will be described as being used to form a partition wall extending from floor to ceiling across the entire width of a room.

[0031] With the curtain 68 firmly and securely attached to the head 14 of at least two apparatuses 10, the partition rod 12 may be placed vertically in the room in the desired position between the floor and ceiling. Because apparatus 10 includes both an optional mechanism to extend the length of rod 12, and extension/retraction apparatus 18, the apparatus 10 may be installed without the need for a ladder or other step stool arrangement. The curtain typically is of sufficient size that it drapes completely to the floor. At this point, rod 12 is extended so that the overall length of apparatus 10 is slightly less than the distance from floor to ceiling. Handle 32 is operated (from floor level) to extend head 14 outwardly from extension/retraction apparatus 18 and in this case toward the ceiling (reference number 70 in FIGS. 1 and 3), to thereby press the upper surface 57 of pad 56, and thus curtain 68 against ceiling 70. As is clear from the explanation above, curtain 68 is thus captured between the ceiling 70 and the upper surface of deformable pad 56.

[0032] Again, as shown in the figures, the curtain 68 is captured between the upper surface 57 of the deformable pad 56 and the ceiling 70. As such, the curtain 68 forms a substantially leak free seal with the wall or ceiling, creating a very tight partition seal. The extension/retraction apparatus 18 is operated to exert substantial pressure between head 14 and the ceiling 70, and to thereby firmly push the head against the ceiling. As noted above, the extension/retraction apparatus uses a ratcheting mechanism so that substantial pressure may be applied by operation of handle 32—up to about 40 psi. Not only does this form a substantially leak free seal between the wall or ceiling and the curtain, but it also makes the rod 12 less likely to become accidentally knocked over if it is bumped into by a worker or a piece of equipment.

[0033] The foot 42 of the rod 12 typically rests on the floor, and as noted, the handle 32 of the extension/retraction apparatus 18 is operated in the manner described above to adjust the pressure exerted by the head 14 against the ceiling 70. If desired, the foot 42 may be oriented on top of curtain 68 where the curtain material lies on the floor; the curtain may be stretched relatively taught prior to assembly as described above, if desired.

[0034] Pressure applied by apparatus 10 between the floor and ceiling is released to disassemble apparatus 10 by releasing dog 38. If desired, one or more apparatuses 10 may be placed horizontally from wall to wall, capturing curtain 68 in the same manner as described above, to tighten the partition between opposing or adjacent walls. Because head 14 is pivotal on shaft 26, apparatus 10 may be oriented between surfaces that are not parallel. As an example, an apparatus 10 may extend between the floor and angled cove molding at the junction between a ceiling and wall. Moreover, it will be appreciated that the apparatus 10 need not be placed vertically or horizontally, and may instead be placed angularly relative to the walls and ceiling, as desired.

[0035] A first alternative embodiment is shown in FIGS. 6 through 8. This embodiment is identical to the former embodiment shown in FIGS. 1 through 5 in all respects, except the head 80 of the apparatus in FIGS. 6 through 8 is somewhat different in structure and in the manner in which it captures and retains curtain 68. Like reference numbers are used throughout this description of the embodiment shown in FIGS. 6 through 8 to refer to like structures shown in the embodiment of FIGS. 1 through 5.

[0036] With reference now to FIGS. 6 through 8, head 80 comprises a circular metallic plate 82 that is pivotally attached to the upper or outward end of shaft 26 with a rivet or bolt 84 that extends through openings formed in tabs 86, 88 that depend from plate 80. An opening is formed through the end of the shaft 26 and the bolt 84 passes through the opening
in the shaft. Head 80 further comprises a deformable pad 90, such as rubber or silicone, which is removably placed over the upper surface 92 of plate 80 so that the upper surface 94 of the pad 90 defines the surface of the head that bears against the ceiling or wall, as detailed below and as shown in the figures. With reference to the cross sectional illustration of FIG. 7, pad 90 is formed with a circumferential and downwardly depending lip 96 that extends around the lower peripheral edge of the pad, and which defines a peripheral edge into which the periphery of plate 80 lies when the pad is assembled onto the plate. With continuing reference to the cross sectional illustration of FIG. 7, the curtain 68 is held in place against the head 80 with a magnet 98. However, in this case the rubber pad 90 is removable from the metallic plate 82. The lower surface of the pad 90 has one or more magnets 98, each of which are retained in into cooperatively formed recesses 100 in the pad. In FIG. 8 there are 3 magnet recesses 100 for receiving three magnets 98 in the lower surface of the pad 90 (only one magnet 98 is illustrated). The magnet recesses 100 are equally spaced around the perimeter of the pad. The magnets 98 may be glued into the recesses 100 or otherwise retained therein so that when the pad 80 is removed from the plate 82, the magnets remain in the pad.

When pad 90 is attached to the upper surface of plate 82 as shown in FIGS. 6 and 8, the magnets 98 secure the pad 90 to the plate 82 with curtain 68 captured therebetween. That is, the curtain 68 is captured between plate 82 and pad 90. In this embodiment, the head 80 is circular. It will be appreciated nonetheless that the head may be of any shape. When apparatus 10 is assembled as described above with the head 80 being pressed against the ceiling, the upper surface 102 pad 90 actually contacts the ceiling 70 rather than the curtain 68, as in the embodiment of FIGS. 1 through 5. Other than as specifically described herein and as shown in the drawings, the device shown in FIGS. 6 through 8 is used in the same manner as the device of FIGS. 1 through 5.

From the foregoing description and accompanying drawings it is clear that the magnets (66, 98) define means for attaching the curtain to the head and preventing relative movement between the two. The magnets function to secure the curtain to the head, yet do not rip the curtain or otherwise damage it.

It will further be appreciated that the apparatus 10 may be used to hold items together or to hold a movable article in a desired position next to a stationary article. As one example, the apparatus may be used to hold crown or cove molding in place while the molding is installed.

While the present invention has been described in terms of a preferred embodiment, it will be appreciated by one of ordinary skill that the spirit and scope of the invention is not limited to those embodiments, but extend to the various modifications and equivalents as defined in the appended claims.

1. A partition rod for retaining a partition curtain in a desired position relative to a surface, comprising,
a partition rod having a first end and a second end and a compression mechanism between the first and second ends, said compression mechanism configured for urging the first end away from the second end;
a head at the first end, said head having a pad configured for abutting the surface and a metallic portion opposite the pad, and a magnet attachable to the metallic portion to secure the partition curtain to the head.

2. The partition rod according to claim 1 wherein the pad defines a surface-contacting member and the metallic portion of the head is on the opposite side of said head from said pad.

3. The partition rod according to claim 2 wherein the curtain is between the surface and the pad.

4. The partition rod according to claim 1 wherein the metallic portion further comprises a first metallic surface and a second metallic surface angularly disposed relative to the first surface.

5. The partition rod according to claim 4 wherein the second surface is defined by a flange and wherein the magnet attaches to both the first and second surfaces.

6. The partition rod according to claim 5 wherein the magnet is cooperatively shaped with the first and second surfaces so that the magnet attached to both the first and second surfaces.

7. The partition rod according to claim 1 including plural magnets, each attachable to the metallic portion to secure the partition curtain to the head.

8. The partition rod according to claim 1 in which the pad comprises a deformable material.

9. The partition rod according to claim 1 in which the head is attached to a shaft that cooperates with the compression mechanism, and wherein the compression mechanism comprises a handle operable for urging the shaft away from the rod, a first dog for securing the shaft relative to the rod, and a second dog for releasing the shaft relative to the rod so that the shaft may be retracted into the rod.

10. The partition rod according to claim 9 wherein the pad is removable from the metallic portion and has an outer surface and an inner surface, wherein the magnet is between the pad and the metallic portion and the curtain is between the inner surface and the metallic surface.

11. The partition rod according to claim 10 including plural magnets, each between the pad and the metallic portion.

12. A partition rod for retaining a partition curtain in a desired position relative to a surface, comprising,
an elongate rod having a foot at one end, a head at the opposite end and a mechanism between the head and foot for selectively controlling the length of the rod;
wherein the head further comprises a metallic plate coupled to the rod, a pad attached to the metallic plate and a magnet attachable to the metallic plate with the curtain disposed between the magnet and the metallic plate.

13. The partition rod according to claim 12 wherein the curtain is disposed between the surface and the pad.

14. The partition rod according to claim 12 wherein the curtain is disposed between the pad and the metallic plate and the pad directly contacts the surface.

15. The partition rod according to claim 12 including more than one magnet, each magnet attachable to the metallic plate to retain the curtain to the head and prevent relative movement therebetween.

16. A partition rod for retaining a partition curtain in a desired position relative to a surface, comprising,
a partition rod having a first end and a second end and rod extension and retraction means between the first and second ends for selectively changing the length of the rod between the first and second ends;
curtain retaining means at the first end for retaining the curtain to the first end, said curtain retaining means comprising a magnet attachable to a metallic member with the curtain between the magnet and the metallic member.

17. The partition rod according to claim 16 wherein the curtain retaining means further comprises a deformable pad
and a metallic plate coupled to the first end of the rod, the magnet attachable to the metallic plate.

18. The partition rod according to claim 17 in which the curtain is retained between the deformable pad and the metallic plate.

19. The partition rod according to claim 17 in which the curtain is retained between the pad and the surface.

20. The partition rod according to claim 19 wherein the metallic plate has a first plate portion for attaching the magnet and a second plate portion angularly disposed relative to the first plate portion and for attaching the magnet.

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