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3,233,277

HINGE

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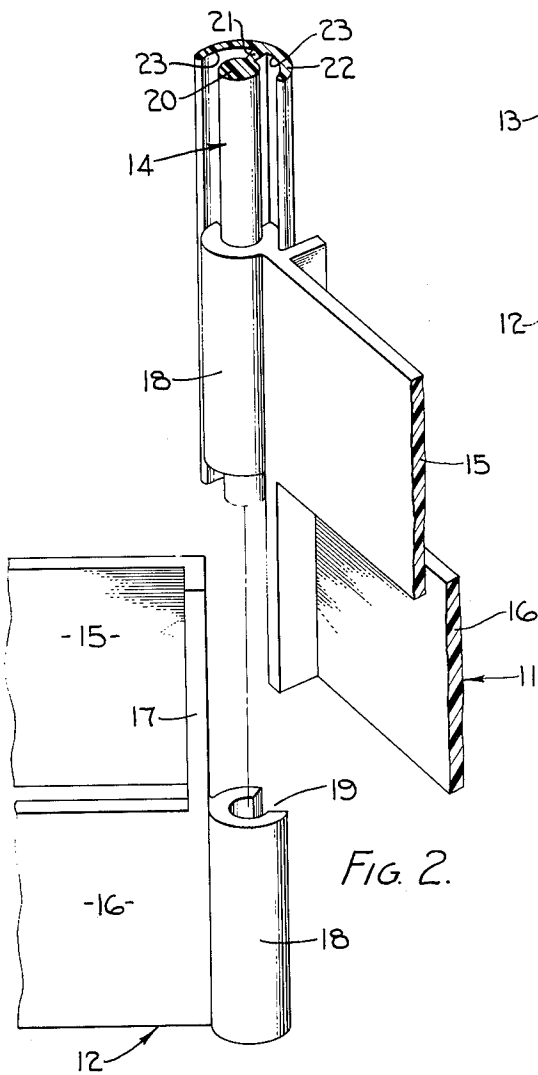


FIG. 2.

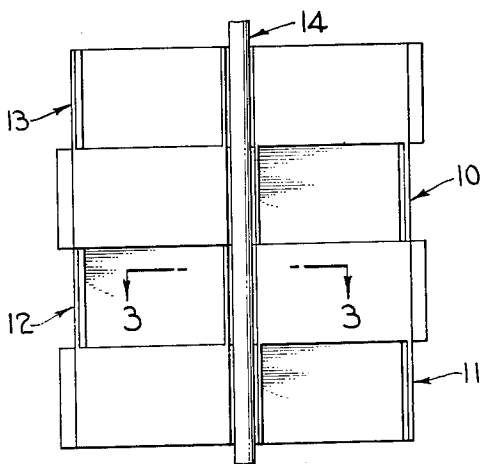


FIG. 1.

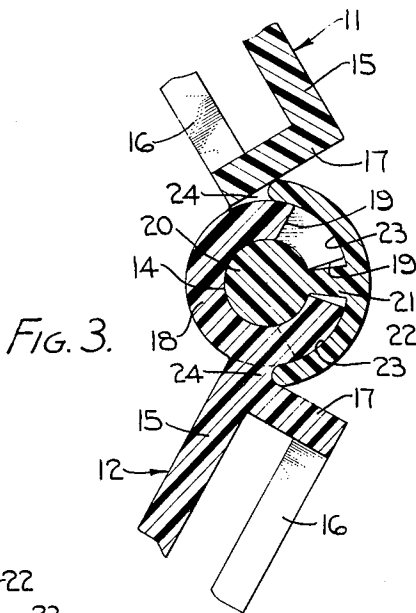


FIG. 3.

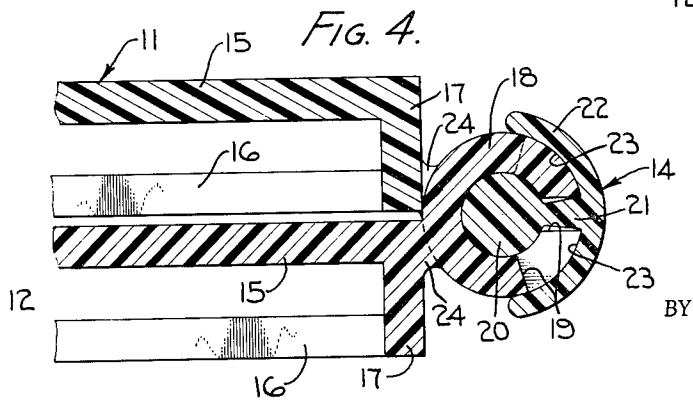


FIG. 4.

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This invention relates to a hinge structure and more particularly relates to a hinge structure useful in the construction of a foldable traverse screen.

In the construction of foldable traverse screens such as are used as window coverings, room dividers, and the like, it is desirable that the screen be foldable into as compact a space as possible. It is further desirable that the screen be provided with protected ventilating slots to permit the passage of air while still maintaining complete visual privacy. A screen fulfilling these requirements is shown in my Patent No. 2,976,923, issued March 28, 1961. While the patented screen is completely satisfactory in construction and appearance, it has been found that in some manufacturing processes it is difficult to maintain the inner diameter of the hinge barrels constant, and thus difficulties sometimes arise in inserting the suspension rods through these hinge barrels.

According to the present invention, a hinge structure is provided whose hinge barrels or channels are less than cylindrical, that is, they cover an arc of less than 360 degrees. Novel hinge pins are provided for cooperating with these channels, and when the hinge channels are mounted on component blocks of a traverse screen, as taught by my aforementioned patent, the hinge pins permit the adjoining groups of blocks mounted thereon to fold parallel with each other, but prevent the groups from falling within a common plane. The hinge members may be produced by a number of different processes and may all be made of plastic.

It is therefore an object of the present invention to provide an improved hinge structure.

It is also an object of the present invention to provide a foldable traverse screen utilizing this improved hinge structure.

It is another object of the present invention to provide such a hinge structure having hinging members which are readily manufactured by a variety of processes.

It is a further object of the present invention to provide a foldable traverse screen utilizing such a hinge structure to permit the screen to be folded into a compact space but to prevent the various panels thereof from falling within a common plane.

These and other objects and advantages of the present invention will become more apparent upon reference to the accompanying description and drawings in which:

FIGURE 1 is a front elevation view of a portion of a screen constructed according to the present invention;

FIGURE 2 is an exploded perspective view of a portion of a screen according to the present invention showing the hinging members thereof;

FIGURE 3 is a view, partly in section, taken along lines 3-3 of FIGURE 1; and

FIGURE 4 is a view similar to FIGURE 3 showing the blocks in their folded position.

Referring now to the several figures, FIGURE 1 shows a plurality of blocks 10, 11, 12 and 13 coupled together by means of a hinge pin 14, the blocks thus making up a portion of a foldable traverse screen. As can be seen from FIGURES 2, 3 and 4, each of the blocks 10, 11, 12 and 13 comprise first and second web portions 15 and 16 lying in different planes and extending between a pair of laterally spaced, parallel end strips 17.

Mounted on each of the end strips 17 is a hinge channel 18, the hinge channels extending no more than one

half the overall height of the end strips and being diagonally positioned on the block, one of the channels being fixed to the upper end of one of the channels being fixed to the upper end of one of the end strips and the other channel being fixed to the lower end of the other of the end strips, the channels thus being disposed symmetrically about the center point of the block. These blocks thus resemble the blocks shown in FIGURE 6 of my aforementioned patent with the exception of the construction of the hinge channels 18. It is to be understood, of course, that the blocks could equally well take the other forms shown in that patent, or any other suitable form, the illustrated structure being only exemplary and not restrictive. As can be seen best in FIGURES 3 and 4, the hinge channels 18 are arcuate and subtend an arc of more than 180°, but less than 360°, the hinge channels shown subtending an arc of about 270°. This construction leaves a gap 19 in the hinge channel, this gap cooperating with the hinge pin to be presently described.

The hinge pin 14 comprises a cylindrical member 20 having a diameter less than the internal diameter of the hinge channel 18 but greater than the width of the gap 19 therein, a radial flange 21 extending along the length of the tubular member 20, and a skirt 22. The skirt 22 is arcuate in form and subtends an angle of approximately 180 degrees. The skirt 22 and member 20 thus cooperate to form a pair of arcuate slots 23, the radial thickness of which is constant. As can be seen from the various figures, the screen is assembled by inserting the cylindrical member 20 of the hinge pin 14 into the hinge channels 18 of the various blocks with the flange 21 extending through the gap 19.

The hinge channels 18 and hence the blocks are able to rotate in the slots 23 about the cylindrical member 20, permitting the screen to be opened to the position shown in FIGURE 3. As can be seen, the amount of rotation of the hinge channels 18 is determined by the size of their gaps 19 and/or the arcuate dimension of the arcuate skirt 22. As shown, the end of the skirt engages the neck of material 24 joining the channel 18 with its end strip 17, thus preventing adjoining panels of blocks from falling within a common plane. This insures that the screen will be easy to open, as pointed out in my aforementioned patent.

As can be seen from FIGURE 4, the various groups of blocks mounted on a hinge pin 14 may be positioned in parallel planes, thus permitting the screen to be folded into a very compact space. The skirt 22 is preferably sufficiently dimensioned to completely cover the gaps 19 in the folded position to add to the appearance of continuity of the screen and enhance its aesthetic appeal.

The hinge structure described has component parts which are considerably simpler to manufacture than those heretofore known and which may be made by a variety of different manufacturing processes. In particular, the hinge channels of the present invention are more easily and cheaply manufactured than the completely cylindrical hinge barrels heretofore used, as it is simpler to use a mandrel to maintain the inner diameter of the hinge channel to the necessary tolerances, and prevent it from collapsing.

The hinge pin is also simply made, utilizing any known extrusion process, and may be made of plastic, as is the remainder of the hinge structure. The hinge structure is particularly useful in the construction of a foldable traverse screen, and enables the screen to be folded into a compact space while preventing it from becoming difficult to fold. It should be understood, however, that while the hinge structure has been described and illustrated in connection with such a screen, it is not intended to limit the present invention to such a use.

The invention may be embodied in other specific forms not departing from the spirit or central characteristics thereof. The present embodiment is therefore to be considered in all respects as illustrative and not restrictive, the scope of the invention being indicated by the appended claims rather than by the foregoing description, and all changes which come within the meaning and range of equivalency of the claims are therefore intended to be embraced therein.

I claim:

1. In a foldable traverse screen, the combination of: a plurality of blocks, each of said blocks having a pair of hinge channels, each of said hinge channels being arcuate and having a longitudinal gap therein; said hinge channels being diagonally disposed on said block, one channel being fixed to the upper end of one side of the block, and the other channel being fixed to the lower end of the other side of the block; and a hinge pin, said hinge pin including a cylindrical member, a flange extending radially outward from said cylindrical member along the length thereof, and an elongated, arcuate skirt affixed to the other end of said flange; said cylindrical member being inserted within one of the hinge channels of each of said blocks with said flange extending through said gap whereby said blocks are held in juxtaposition, said arcuate skirt preventing successive blocks from standing in a common plane.

2. In a foldable traverse screen the combination of: a plurality of blocks, each of said blocks having a pair of laterally spaced, parallel, end strips, a web portion joining said end strips and a pair of hinge channels mounted on said end strips, each of said hinge channels being arcuate and subtending an angle greater than 180° but less than 360°, said hinge channels being diagonally disposed on said block, one channel being fixed to the upper end of one of said end strips and the other channel being fixed to the lower end of the other of said end strips; and a hinge pin, said hinge pin including a cylindrical member having a diameter less than the internal diameter of said hinge channels, a flange extending radially outward from said cylindrical member along the length thereof, and an elongated, arcuate skirt affixed to the other end of said flange; said cylindrical member being inserted within one of the hinge channels of each of said blocks whereby said blocks are held in juxtaposition, said arcuate skirt preventing successive blocks from standing in a common plane.

3. In a foldable traverse screen the combination of: a plurality of blocks, each of said blocks having a pair of laterally spaced, parallel, end strips, a web portion joining said end strips, said web portion lying in at least two parallel planes, and a pair of hinge channels mounted on said end strips, each of said hinge channels being arcuate and subtending an angle greater than 180° but less than 360° whereby a longitudinal gap is formed, said hinge

channels being diagonally disposed on said block, one channel being fixed to the upper end of one of said end strips and the other channel being fixed to the lower end of the other of said end strips; and a hinge pin, said hinge pin including a cylindrical member, said cylindrical member having a diameter less than the internal diameter of said hinge channels but greater than the width of said gap, a flange extending radially outward from said cylindrical member along the length thereof, and an elongated, arcuate skirt affixed to the outer end of said flange; said cylindrical member being inserted within one of the hinge channels of each of said blocks whereby successive blocks may pivot on said hinge member into parallel relationship but are prevented from pivoting into a common plane by the engagement of the ends of said skirt with said blocks.

4. In a foldable traverse screen the combination of: a plurality of blocks, each of said blocks having a pair of laterally spaced, parallel, end strips, a web portion joining said end strips and a pair of hinge channels mounted on said end strips, each of said hinge channels being arcuate and subtending an angle greater than 180° but less than 360° whereby a longitudinal gap is formed, said hinge channels being diagonally disposed on said block, one channel being fixed to the upper end of one of said end strips and the other channel being fixed to the lower end of the other of said end strips; and a hinge pin, said hinge pin including an elongated cylindrical member having a diameter less than the interior diameter of said hinge channels, a flange extending radially outward from said cylindrical member along the length thereof, and an elongated arcuate skirt affixed to the other end of said flange, said skirt, said cylindrical member and said flange thereby forming a pair of slots of substantially constant radial thickness; said cylindrical member being inserted within one of the hinge channels of each of said blocks with said radial flange extending through the gaps therein whereby the portions of said hinge channels adjacent said gaps are positioned within said slots and the ends of said skirt cooperate with said blocks to limit rotational movement of said hinge pin relative thereto.

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