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(54) Improvements relating to tambour doors.

(57) A tambour door has a plurality of vertical laths (9) interconnected edge-to-edge in a manner allowing the door to move around corners. The door is suspended from an overhead track (3,17,23), each lath (9) having a runner (5,19,24) which engages that track, while at the bottom each lath (9) has a runner (13,19,24) co-operating with a track (11,17,23) directly below the overhead track. Both tracks (3,11 ;17) can be identical. The runners can embrace the tracks (3,11) or engage within them (17), and to negotiate curves while not being too loose on the straights the runners (24) may have protuberances (25) spaced longitudinally of the track (23) and providing the only lateral contact.

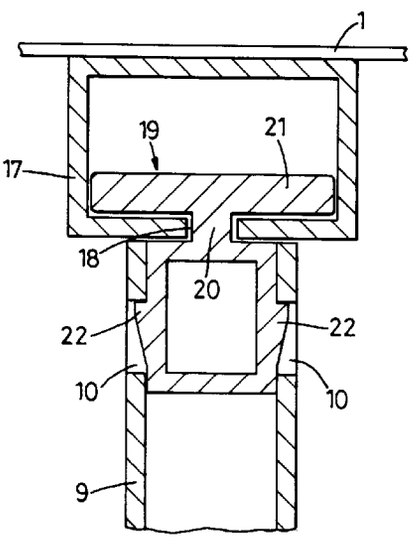

Fig. 3

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This invention relates to tambour doors. These have a plurality of inter-engaged narrow vertical laths capable of developing into curves centred on vertical axes. They are mounted by a guidance system so that from the closed position in which they are usually flat across the front of a cabinet, they can be slid sideways and move around sharp curves near the front corners and then along inside the side walls and finally perhaps around further corners and along inside the back wall.

A common problem with such doors is that the laths slip to a slanting position commonly called "crabbing". A known method of overcoming this is to stick cloth or tape to the hidden side of the laths so that each lath is locked to the next in the longitudinal or vertical sense.

Another, more complicated and expensive solution is to have a mechanical guidance system behind each corner around which the door must turn. This usually takes the form of a rotatable vertical bar with cogged wheels or sprockets at least at the top and bottom which positively engage the shaped reverse side of each lath. This ensures that the top and bottom movement of each lath is identical.

The aim of this invention is to provide a much simpler guidance system where the door will run freely with minimal risk of crabbing.

According to the present invention there is provided a tambour door comprising a plurality of vertical laths connected edge-to-edge in a manner permitting curvature of the door about vertical axes, and similarly contoured overhead and bottom tracks by which the laths are guided, characterised in that each lath is suspended from the overhead track, and the bottom track serves only as a guide and not as a support for the lower ends of the laths.

Generally, the practice has been to support the laths at the base and simply guide them at the top. Without extra restraint, the laths can fall into a crabbed attitude. Also, a track at the base tends to accumulate dirt and other foreign bodies such as paper clips, and laths can easily jam when the door is being slid. A track at the top will be far less likely to be obstructed, and the laths will naturally hang vertically. The bottom track of this arrangement will not have a support function and the mutual engagement can be quite loose. However, the tracks are conveniently of identical construction.

Generally, the laths will have runners fixed to their ends to co-operate with and be guided by the tracks. The overhead track may have laterally projecting flanges around which engage the runners fixed to the upper ends of the laths. In one preferred form the tracks are of inverted π-section so that in the overhead track the cross-bar provides the flanges referred to above. In the bottom track, the two upstanding portions may be embraced by the runners at the lower ends of the laths or those runners could engage between them.

Alternatively, the overhead track may have a section in which an upper part of each co-operating runner engages. A box-section with a longitudinal slot in the underside is suitable. The bottom track may be an inversion of this, while the co-operating runners can be similar to those at the top of the door.

For negotiating curves while not allowing too much transverse looseness on the straights, each runner preferably bilaterally engages its associated track at pairs of points separated longitudinally of the track.

This guidance system allows the door to turn very sharp corners and indeed at the rear corner of a cabinet the tracks can be doubled back on themselves so that, instead of part of the door when opened lying along the back wall of the cabinet, there can be a double thickness of the door along the side wall.

For a better understanding of the invention, some embodiments will now be described, by way of example, with reference to the accompanying drawings, in which:

Figure 1 is a cross section of an overhead support track and an upper part of a tambour door,

Figure 2 is a cross section of a floor guidance track and a lower part of such a door,

Figure 3 is a cross section of another track with part of a tambour door, and

Figure 4 is a plan view of part of a track with co-operating runners.

The door of Figures 1 and 2 is fitted to a cabinet (not shown in full) with a top 1 and a base 2. Attached to the underside of the top 1 there is a track 3, conveniently of extruded plastics, with a cross section in the form of the Greek letter π but inverted. It thus provides laterally projecting flanges 4. Runners 5 are engaged with this track and can slide along it. They consist of a shallow channel shaped portion 6 with inturned rims 7 which engage over the flanges 4. The internal width of the channel is greater than the width of the track across the flanges 4 to give the runners 5 scope to go round corners easily. Below the portion 6 there are two downwardly projecting barbs 8 which enter the top of a respective lath 9 of a tambour door and positively engage in holes 10.

On the base 2 a track 11 identical to the track 3 is secured directly below the upper one. It is in the same attitude so that the flanges are actually on the base 2 while the two vertical ribs 12 project upwardly. Each lath has a runner 13 with an inverted U-shaped portion 14 which loosely embraces the ribs 12 of the track 11 and which is fixed to the respective lath by barbs 15 engaging in holes 16, similar to the barbs 8 and holes 10. This runner 13 merely guides and does not support.

It will be understood that the laths are interconnected in conventional fashion along their longitudinal edges allowing them to bend around a vertical

corner. They will hang vertically under their own weight, which will be carried entirely by the overhead track 3.

Instead of the runners 5 being in the form of gliders, they could be wheeled to reduce friction. Also, at the bottom of the door the runners 13 could be shaped to engage between the ribs 12 rather than outside them.

In Figure 3, the top 1 of a cabinet and a lath 9 (with its holes 10) of a tambour door are referenced as before. A track 17 is of almost complete box section, but its underside is centrally divided by a longitudinal slot 18. A runner 19 is of approximate T-form, its stem having a neck 20 which fits with clearance in the slot 18. Immediately above this, the horizontal portion 21 of the runner extends over and is supported by the inturned flanges of the track 17. Below it, the stem widens to fit within the upper end of the lath 9 and has barbs 22 to snap into the holes 10.

This arrangement can be inverted and serve to guide the bottom of the suspended door.

Again, there could be wheels or rollers to reduce friction.

To keep the door laths aligned either in a plane or in a smooth curve, the runners must have a certain dimension longitudinally of the track. Then, in order to negotiate curves, they must not fit too closely across the track. However, looseness will allow flat portions of the door to rattle and a compromise is needed. Figure 4 shows a curved portion of a track 23 with runners 24 engaging the outside in the manner of Figure 2. Over most of their length the runners 24 are clear of the sides of the track 23, but at their ends they have smoothly rounded inwardly projecting protuberances 25 which engage those sides. The laths are therefore firmly guided at every point along the track, but not so firmly as to impede smooth sliding action even at corners.

If the radial span of the track 23 around the curve is the same as its span along the straights, and if the protuberances 25 are all in contact with the track sides along the straights, then the runners 24 will be forced to spread very slightly as they go around the curve. But the distortion will be very small and well within the capability of a runner made of plastics material. The increased friction arising from the tighter grip will be negligible. In practice however, it is likely that the tolerances will be such that there will be a very slight transverse looseness on the straights, sufficient to minimise or eliminate distortion on the curves.

These protuberances could be replaced by rollers.

When the runners are of a type that engage within a track (as in Figure 3), similar, external protuberances or rollers can be provided.

Claims

1. A tambour door comprising a plurality of vertical laths (9) connected edge-to-edge in a manner permitting curvature of the door about vertical axes, and similarly contoured overhead and bottom tracks (3,11;17;23) by which the laths (9) are guided, characterised in that each lath (9) is suspended from the overhead track (3,17,23), and the bottom track (11,17,23) serves only as a guide and not as a support for the lower ends of the laths (9).

2. A door as claimed in claim 1, characterised in that the tracks (3,11;17;23) are of identical construction.

3. A door as claimed in Claim 1 or 2, characterised in that said laths (9) have runners (5,13;18;24) fixed to their ends to co-operate with and be guided by the tracks (3,11;17;23).

4. A door as claimed in Claim 3, characterised in that the overhead track (3) has laterally projecting flanges (4) around which engage the runners (5) fixed to the upper ends of the laths (9).

5. A door as claimed in Claim 4, as appendant to Claim 2, characterised in that the tracks (3,11) are of inverted π-section.

6. A door as claimed in Claim 5, characterised in that the bottom runners (13) embrace the two upstanding portions (12) of the track (11).

7. A door as claimed in Claim 6, characterised in that the bottom runners engage between the two upstanding portions (12) of the track.

8. A door as claimed in Claim 3, characterised in that the overhead track (17) has a section in which an upper part (21) of each co-operating runner (19) engages.

9. A door as claimed in Claim 8, as appendant to Claim 2, characterised in that the bottom track is an inversion of the overhead track (17) and the co-operating runners are similar to those (19) at the top of the door.

10. A door as claimed in any preceding claim, characterised in that each runner (24) bilaterally engages its associated track (23) at pairs of points (25) separated longitudinally of the track.

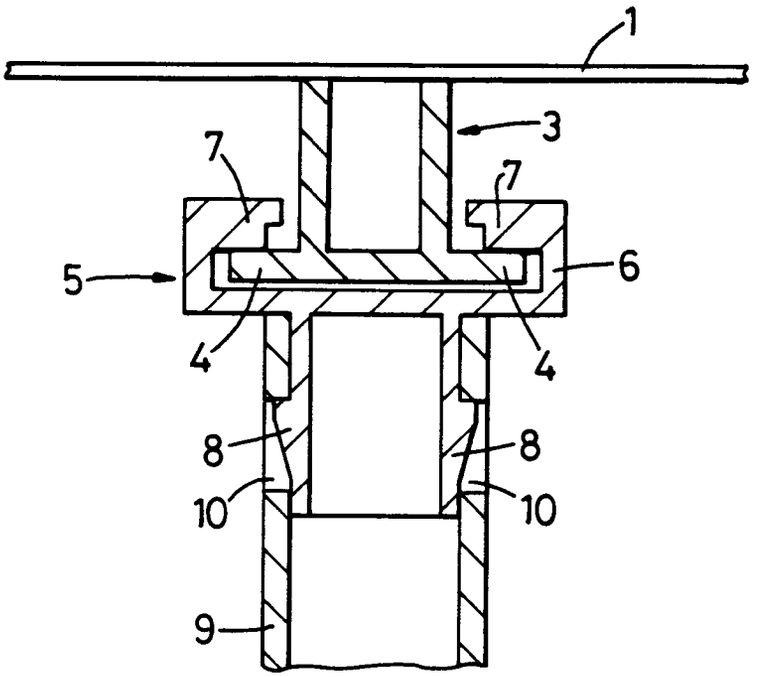

Fig. 1

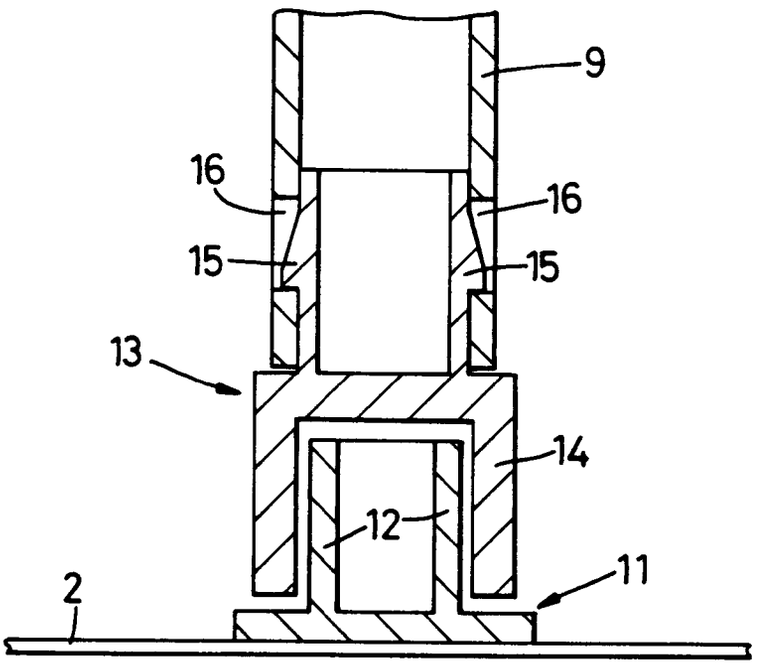

Fig. 2

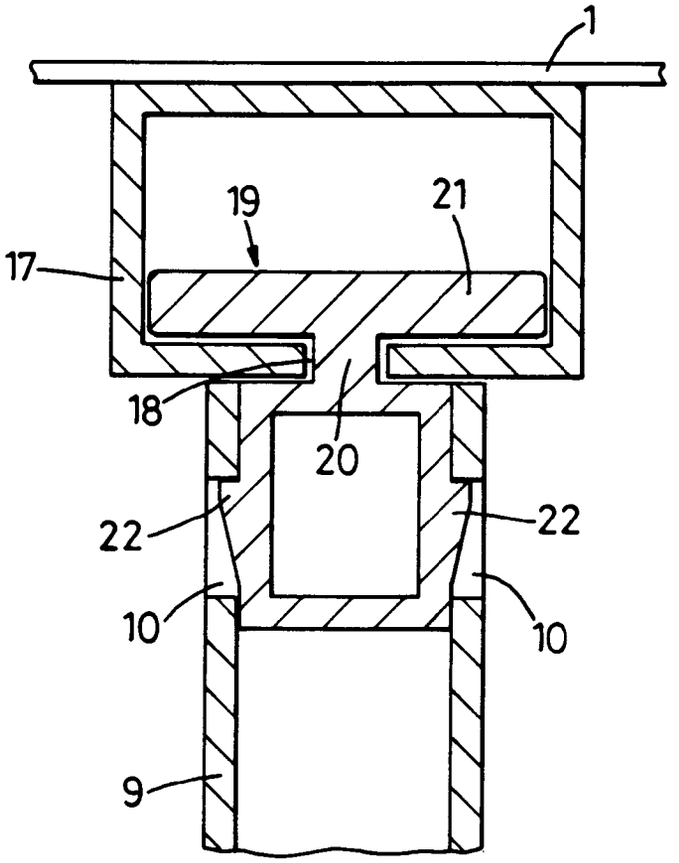

Fig. 3

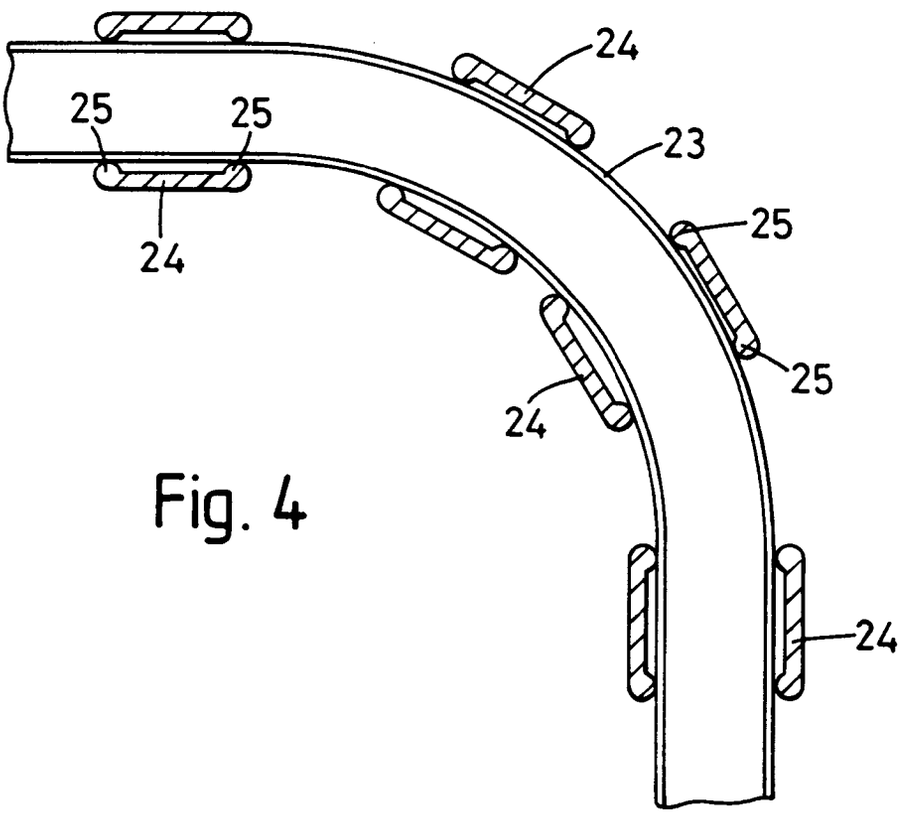

Fig. 4

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EUROPEAN SEARCH REPORT

Application Number
EP 93 30 5245

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl.5)
X	DE-U-9 112 024 (MEIR) * page 5, line 25 - line 33; figures *	1-3,8-10	E06B9/58 E06B9/11
Y		4	
X	GB-A-1 011 579 (COWLING) * the whole document *	1	
Y	US-A-5 063 636 (DICKSON) * the whole document *	4	
A	EP-A-0 170 338 (ASSENBURG B.V.) * page 3, line 29 - line 36; figures 2,3 *	3	

TECHNICAL FIELDS SEARCHED (Int. Cl.5)
E06B E05D

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	15 OCTOBER 1993	KUKIDIS S.

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
Y : particularly relevant if combined with another document of the same category
A : technological background
O : non-written disclosure
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T : theory or principle underlying the invention
E : earlier patent document, but published on, or after the filing date
D : document cited in the application
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