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(54) **Rolling door, rolling shutter or the like.**

(57) Rolling door, rolling shutter or such provided with a number of profiles (8) which can hinge relatively to each other around hinge pins, which extend at least substantially at a right angle to the direction in which the profiles are displaceable along the ends of rails (27) guiding the profile for opening and/or closing the rolling door, rolling shutter or such, with coupling pieces attached at the ends of the profiles, which coupling pieces are mutually coupled with the aid of a strap (26) which extends in the possible direction of displacement of the profiles, which is flexible in one direction, such that the strap allows the hinging movement of the profiles.

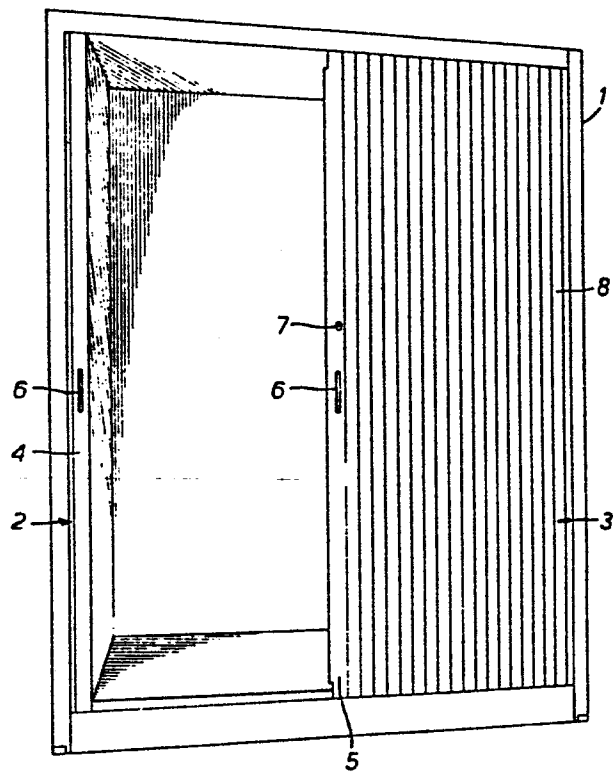


FIG. 1.

Rolling door, rolling shutter or the like.

The invention relates to a rolling door, rolling shutter or the like, provided with a number of profiles, which can hinge relatively to each other around hinge pins, which extend at least substantially at a right

5. angle to the direction in which the profiles are displaceable along the ends of rails guiding the profile for opening and/or closing the rolling door, the rolling shutter or the like.

With known rolling doors, rolling shutters or the like of the above kind the profiles themselves are mostly provided with interlocking

10. parts which are formed in such a way that these interlocking parts not only serve to keep the profiles coupled with each other, but also have to serve as a hinged connection between the profiles. On the one hand this requires a rather complicated form of the profiles, which makes the production of such profiles expensive, but also the coupling of these pro-
15. files with each other is a difficult and time-consuming job.

The invention aims at obtaining a rolling door, rolling shutter or such of the above kind, while avoiding said disadvantages which occur with the known rolling doors, rolling shutters or such.

- According the invention this can be achieved because at the
20. ends of the profiles coupling pieces are attached, which are mutually coupled with the aid of a strap which extends in the possible direction of displacement of the profiles, which is flexible in one direction, such that the strap allows the hinging movement of the profiles.

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In this way, with the aid of simple coupling pieces which are mutually connected by a flexible strap, a connection can be obtained between the profiles which are arranged next to each other, with the strap also allowing a hinging movement of the profiles relatively to each other, which makes it possible to achieve a considerable simplification with regard to existing constructions.

The invention will be further explained below with reference to embodiments of the construction according to the invention shown in the figures enclosed.

Fig. 1 shows a view on a cupboard, provided with a pair of rolling doors according to the invention, one of which is shown in the opened position and the other in the closed position.

Fig. 2 shows in perspective a view on a coupling piece applied in the construction by the invention.

Fig. 3 shows in perspective the coupling piece shown in fig 2, seen from the other side.

Fig. 4 shows a view on the ends of a pair of rolling doors.

Fig. 5 shows a cross-section of the ends of a pair of rolling doors.

Fig. 6 shows a side view of the bottom part, supported by a rail, of a profile which forms a part of a rolling door.

Fig. 7 shows a view on a connecting piece for connecting adjacent profiles with each other between the ends of the profiles.

Fig. 8 shows a top view on fig. 7.

Fig. 9 shows a bottom view on fig. 7.

Fig. 10 shows a view on fig. 7, seen by arrow X in fig. 7.

Fig. 11 shows a view on a number of coupling pieces which are integrated with each other and mutually connected by the flexible strap.

Fig. 12 shows a top view on fig. 11.

Fig. 13 shows a bottom view on fig. 11.

Fig. 14 shows a side view on fig. 11.

Fig. 15 shows a view on some profiles, which are mutually connected with each other by the coupling pieces shown in figures 11-14, with the coupling pieces and the profiles cut through in several places.

In fig. 1 a cupboard 1 is shown, which can be closed with the aid of a pair of rolling doors 2 and 3, of which rolling door 2 is shown in the opened position and rolling door 3 in the closed position. Consequently of rolling door 2 practically only the vertically standing end-profile 4 is visible, which in the closed position of the cupboard is ad-

5. adjacent to endprofile 5 of rolling door 3. In the endprofiles 4 and 5 grips 6 are built, while endprofile 5 is also provided with a lock 7. Connected to the endprofiles are the other vertically extending profiles 8, which all have the same construction. As appears in particular from fig. 5 each profile possesses a web 9 forming a part of the front side of the door and a pair of legs 10 and 11 extending perpendicularly to the web. Leg 11, which is somewhat wider than leg 10 is provided with a lip 12 bent in a direction turned away from leg 10 over an angle of 90° .

10. For mutually coupling the bottom parts respectively the top parts of the profiles with each other the coupling pieces shown in fig. 2 and 3 are used.

15. Each coupling piece comprises a web 13 with bent edges 14 at the free ends of which projections 15, with a wedge-shaped section, have been provided. Connected to the centre of the web is a rib 16, extending between bent edges 14 and at a right angle on the web, said rib connecting the web with a bar shaped part 17 which lies at distance from the web. At the end the coupling piece has a flange 18 joined to body 13, the end of 16 and bar shaped part 17, a pair of wings 20, situated at distance of each other, joining said flange 18. The facing planes 21 of the wings 20 have been made curved.

20. Further a projecting nose 22 has been provided near the one short side of flange 18 in the corner and near the centre of the other short side a projecting nose 23 has been provided. Further a nose 24, extending at a right angle on web 13, has been provided on the end of web 13, which lies near wings 20.

25. Further a slotted hole 25 (fig. 6) has been made in every bar shaped part 17, through which an oblong, only very partly shown in fig. 2, strap 26 can be passed, said strap being flexible about an axis extending parallel to the longitudinal axis of bar shaped part 17.

30. Both in the top end and in the bottom end of every profile 4, 5 or 8, which forms a part of a door 2 or 3, such a coupling piece can be inverted. Thereby said noses 22, 23 and 24 will rest in recesses made in web 9 and in legs 10 and 11 of the profiles and which are open at the bottom side resp. top side of the profiles in question. On inserting the wedge-shaped projections 15 are pressed somewhat inwards, so that they
35. can slide along the facing sides of legs 10 and 11 on inserting the coupling pieces in the relevant profiles. At some distance of the ends of the profiles recesses have been made in legs 10 and 11 for accommodating wedge-shaped projections 15 in the aimed end position of the coupling pieces

in the profiles so that the coupling pieces are secured against movement in the longitudinal direction of the profiles.

For inserting the coupling pieces into the profiles the desired number of coupling pieces has already been put on a single long strap 26. Both long strap 26 and the coupling pieces are preferably made of synthetic material whereby the coupling pieces can be welded to the strap at the desired distance of each other at the level of bar shaped parts 17. The construction is then such that in a flat part of the door noses 22 and 23 of a coupling piece lie against adjacent coupling pieces to limit rotation in one direction.

10. As will further appear from fig. 6 legs 10 and 11 are partly cut away near the ends of the profiles at the ends turned away from body 9 so that room is created there within the external limitation of the profiles for the lead-through of strap 26.

With the aid of wings 20 of the coupling pieces the coupling pieces can be guided along a rail 27, which is taken up between the two wings 20. Because the facing planes 21 of wings 20 have been made curved it is possible for the wings to pass curves in the rail too. When taking a curve in the rail it must be possible for the profiles to hinge relatively to each other around hinge pins extending parallel to the profiles. This is made possible by strap 26, which connects the coupling pieces, connected with the various profiles, with each other, as said strap is flexible around axes extending parallel to the longitudinal axes of the profiles.

It will be clear that in using the construction according to the invention simply formed profiles can be used for making the door, while these profiles have been coupled pivotally with each other both at their bottom end and at their top ends with the aid of coupling pieces and a flexible endless strap.

With long profiles it can be desirable to connect the profiles also between their ends to prevent the profiles from bulging out relatively to each other. For this purpose use can be made of the connecting piece shown in fig. 7-10. This connecting piece comprises a pair of legs 28 and 29 perpendicular on each other whereby leg 28 projects beyond leg 29 on both sides. A pair of wedge-shaped projections 30 as well as a T-shaped connecting piece 31 which lies between the projections have been provided on longer leg 29 at the side turned away from leg 29.

As shown in fig. 5 such a connecting piece can be coupled with a leg 10 of a profile by sliding the T-shaped connecting piece into a slot made into a profile for this purpose, which is open at the side turned

away from the web 9. In the position shown in fig. 5 the two wedge-shaped projections 30 are clicked into holes, made into the relevant web 10, which are not open to the side of the flange, so that these projections 30 secure the connecting piece in the position shown.

5. Leg 29 has been put through a consequently dimensioned slotted hole made into a lip 12 of an adjacent profile as will also appear from fig. 5. Thus, with the aid of such a connecting piece a pivotal connection has been achieved between adjacent profiles, while a bulging out of the profiles relatively to each other is prevented with the aid of the connecting piece.

In fig. 11-15 a further embodiment of a connecting piece is shown. Here a connecting piece comprises a tubular, body 32 having a substantially rectangular section, which is open at one side and closed at the other side by an end wall 33 to which join a pair of wings 34, similar to wings 20. On one of the wide sides of body 32 a back 36, extending in the longitudinal direction of the body and positioned near the centre, has been formed and the backs 36 of the adjacent bodies 32 are mutually connected by connecting pieces 37, which connecting pieces, together with backs 36 joined to it, form as it were a long strap connecting the various bodies 32 to a whole, which enables a pivotal movement of bodies 32 relatively to each other around longitudinal hinge pins extending parallel to the longitudinal axes of these bodies. The short sides of bodies 32 are provided with projecting bosses 35 at their ends which lie near wings 34, which bosses limit a rotation of the bodies relatively to each other in one direction in a position, in which all bodies 32 are positioned in a straight line, as will be clear from the figures. At the same time these bosses 35, together with the bosses 35' made on the sides turned away from strap 36, 37, form stops which limit a sliding into profiles 8, because the fall into recesses made for this purpose in the ends of the profiles.

30. At some distance of the open ends of bodies 32 projections 37, similar to the wedge-shaped projections 15 of the first embodiment, have been made, which, in the pushed in position of the coupling pieces, snap into the profiles in recesses made into the flanges of the profiles for this purpose to prevent displacement of the coupling pieces.

35. It will be clear that the main difference between this embodiment and the embodiment of the coupling pieces described above lies in the fact that in the latter embodiment the coupling pieces are combined to an unit with the aid of parts 36, 37, which form the strap.

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CLAIMS.

1. Rolling door, rolling shutter or the like provided with a number of profiles, which can hinge relatively to each other around hinge pins which extend at least substantially at a right angle to the direction in which the profiles, for opening and/or closing the rolling door, the rolling shutter or the like are displaceable along the ends of rails guiding the profiles, characterised in, that coupling pieces have been attached to the ends of the profiles, said coupling pieces being mutually coupled with the aid of a strap extending into the possible direction of displacement of the profiles, said strap being flexible in one direction, such that the strap allows the hinging movement of the profiles.
2. Rolling door, rolling shutter or the like, characterised in that the coupling pieces are provided with bodies to be inserted between parts of the ends of the profiles, said bodies being provided with projections, which fit in recesses made in the profiles to limit displacement of the coupling pieces.
3. Rolling door, rolling shutter or the like, according claim 1 or 2, characterised in, that a profile has been provided with a web forming part of the front side of a rolling door, rolling shutter or the like and legs extending substantially at a right angle on this web, said legs

being cut away partly for passing the strap.

4. Rolling door, rolling shutter or the like according anyone of the preceding claims, characterised in that a coupling piece is provided with a pair of wings projecting beyond the end of a profile, the facing
5. boundary planes of which have been rounded.
5. Rolling door, rolling shutter or the like according anyone of the preceding claims, characterised in that protruding parts have been provided on the sides of the coupling pieces facing each other, for limiting swivelling of the coupling pieces relatively to each other in at least one
10. direction.
6. Rolling door, rolling shutter or the like according anyone of the preceding claims, characterised in, that the coupling pieces are provided with bar shaped parts into which slotted holes have been made for passing the strap.
15. 7. Rolling door, rolling shutter or the like according anyone of the preceding claims, characterised in, that the coupling pieces and the strap which mutually connects the coupling pieces form one unit with each other.

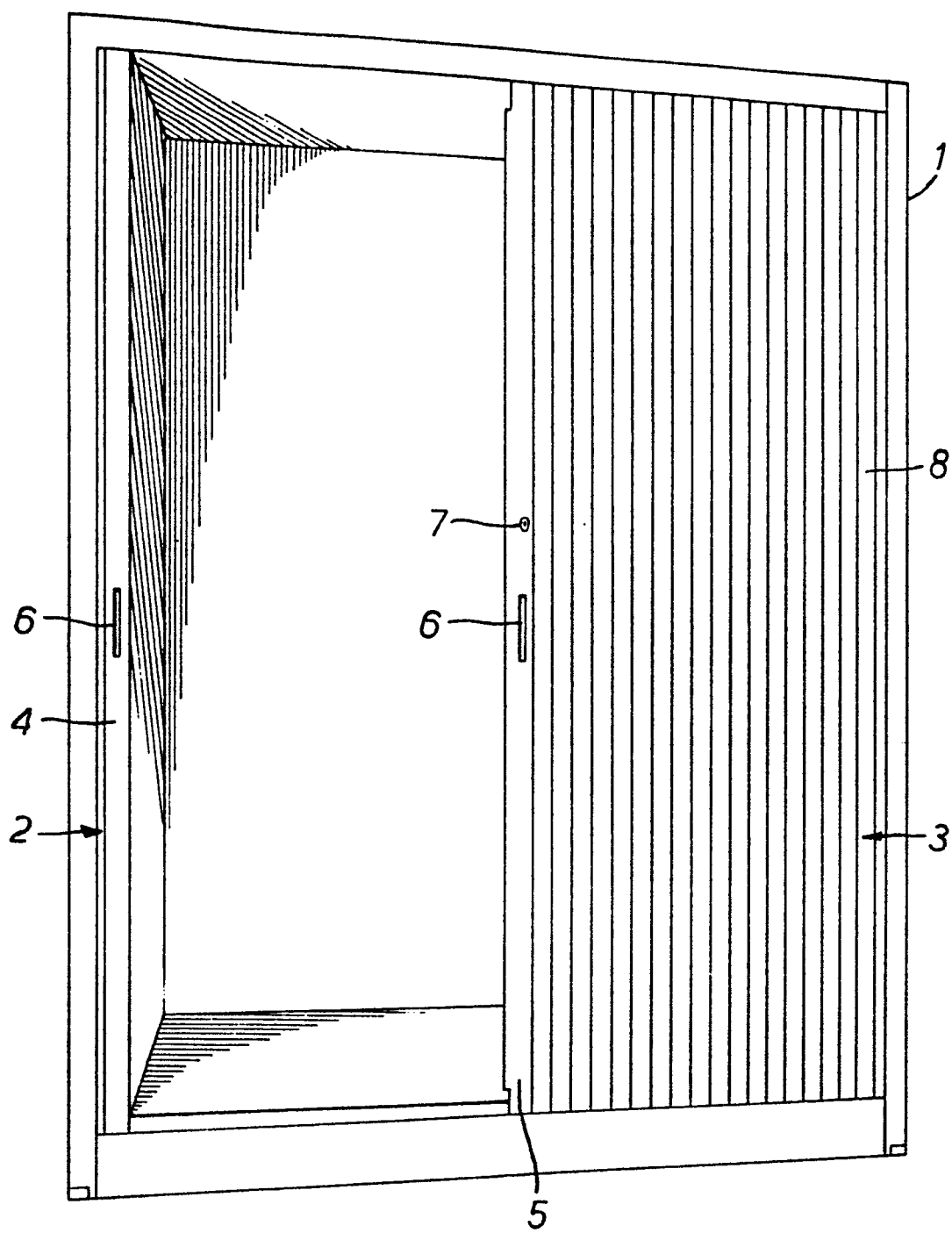
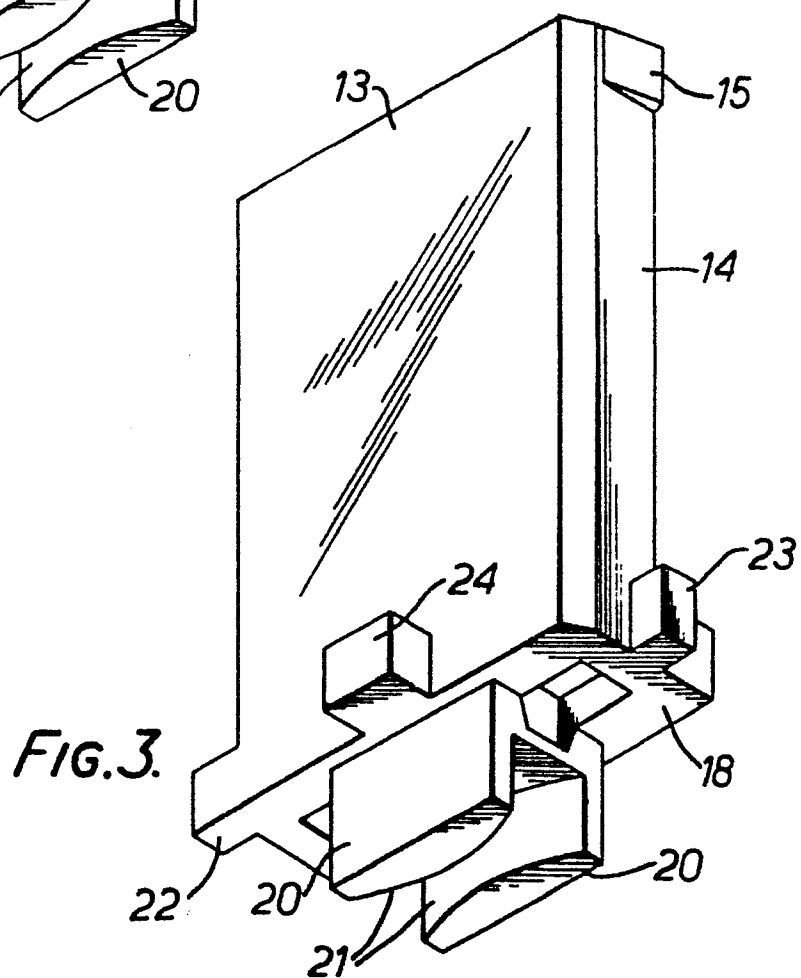
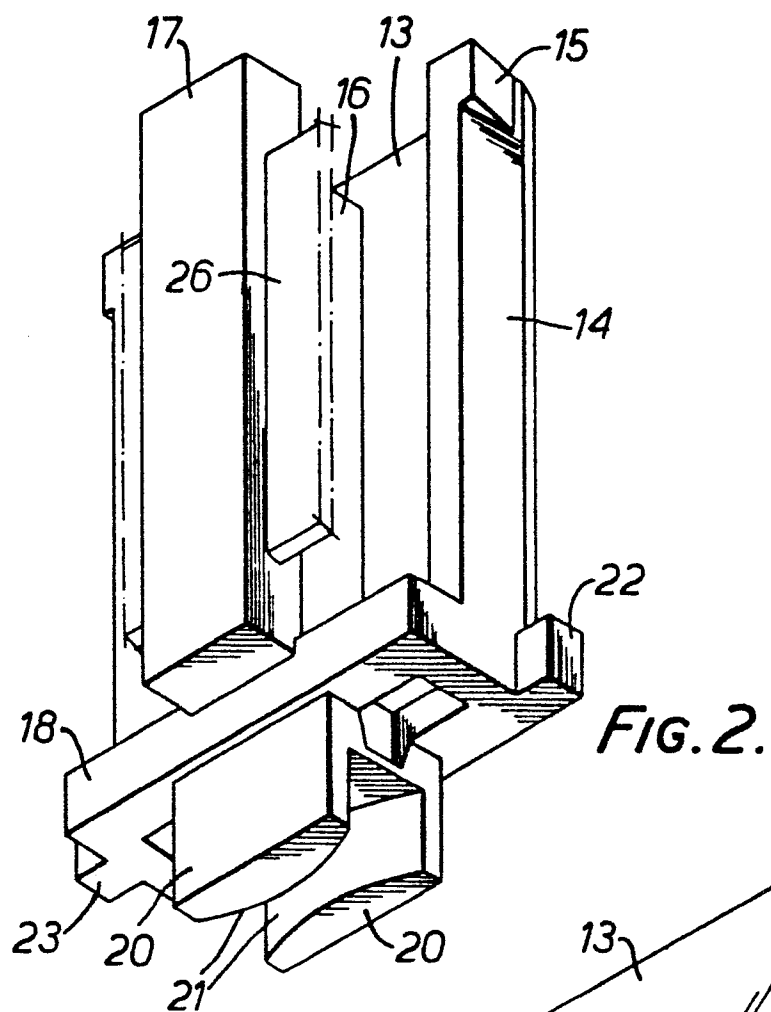


FIG. 1.



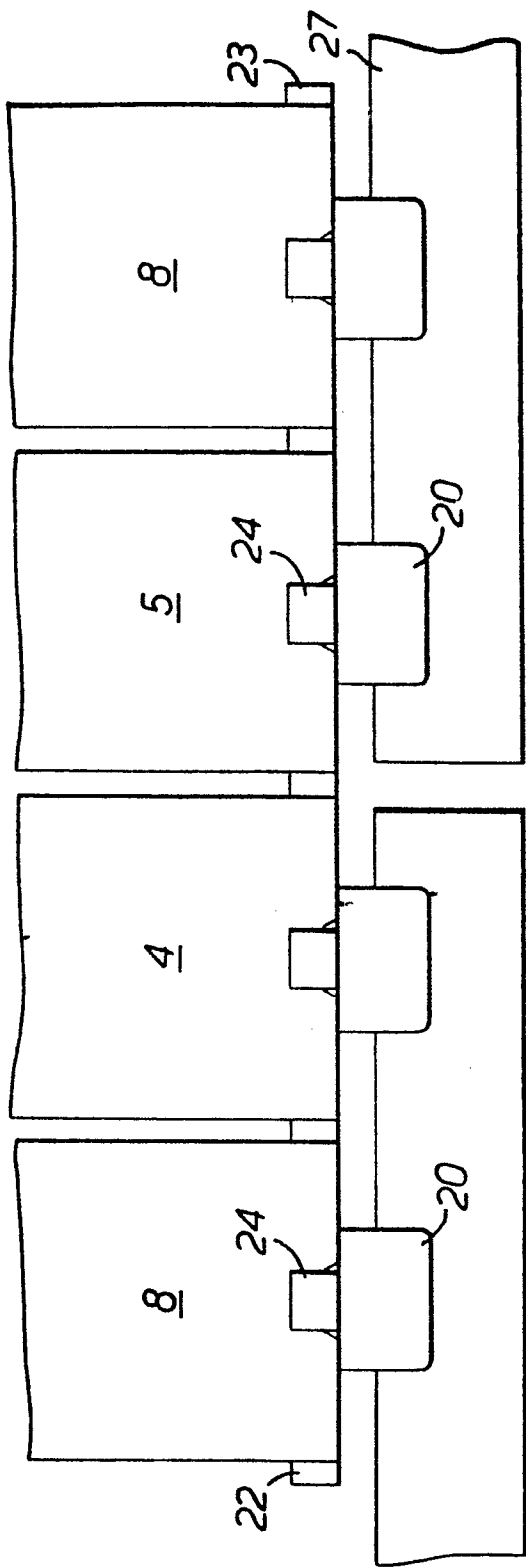


FIG. 4.

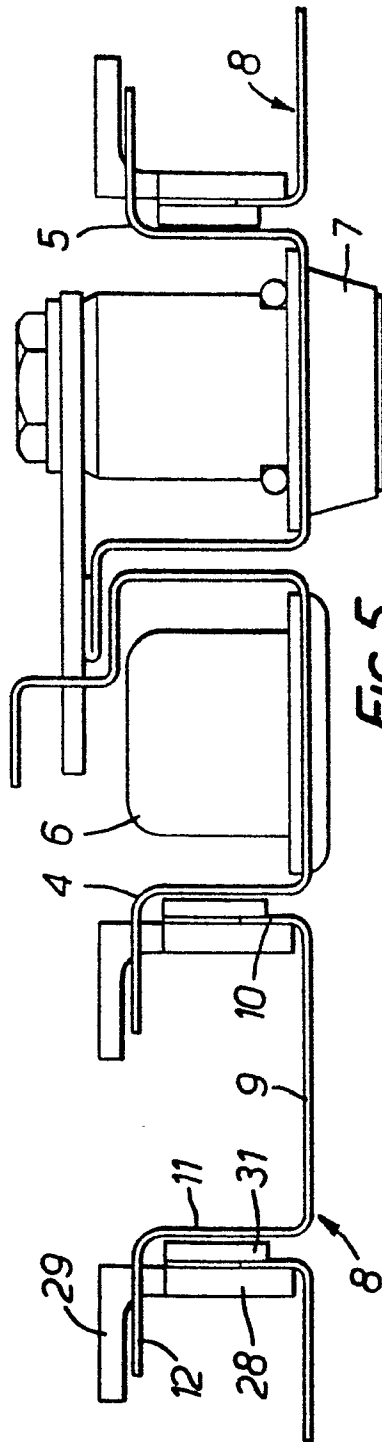


FIG. 5.

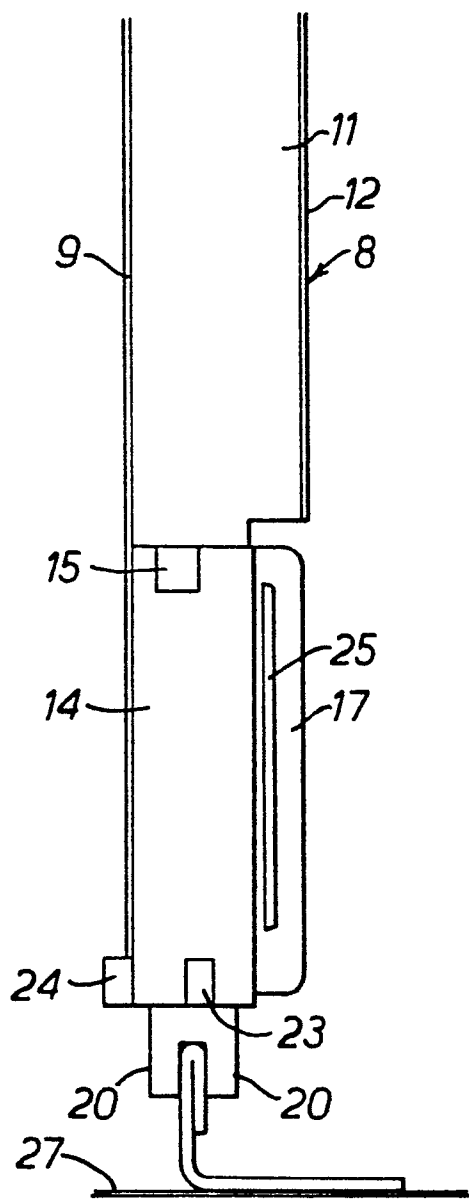


FIG. 6.

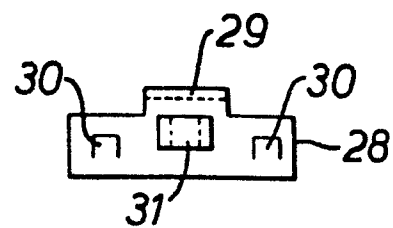


FIG. 8.

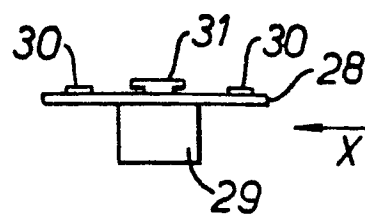


FIG. 7.

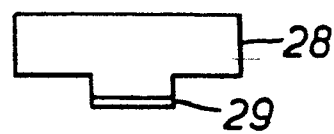


FIG. 9.

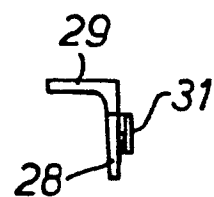


FIG. 10.

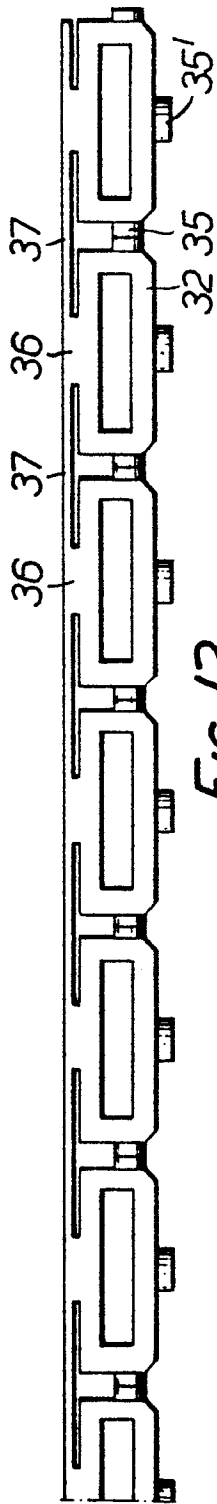


FIG. 12.

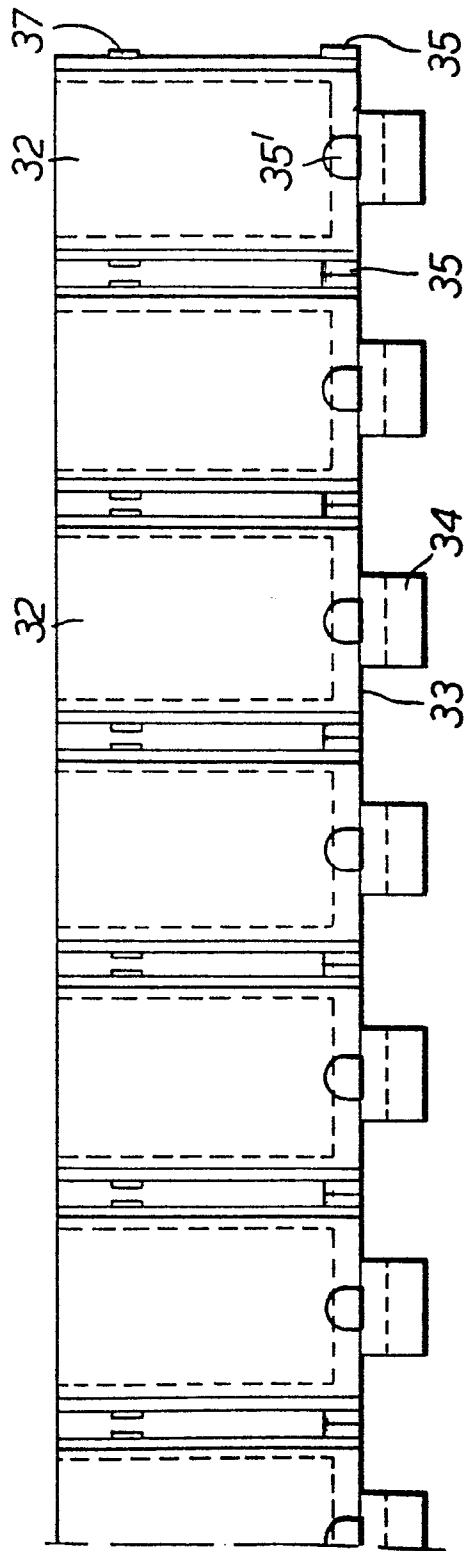


FIG. 11.

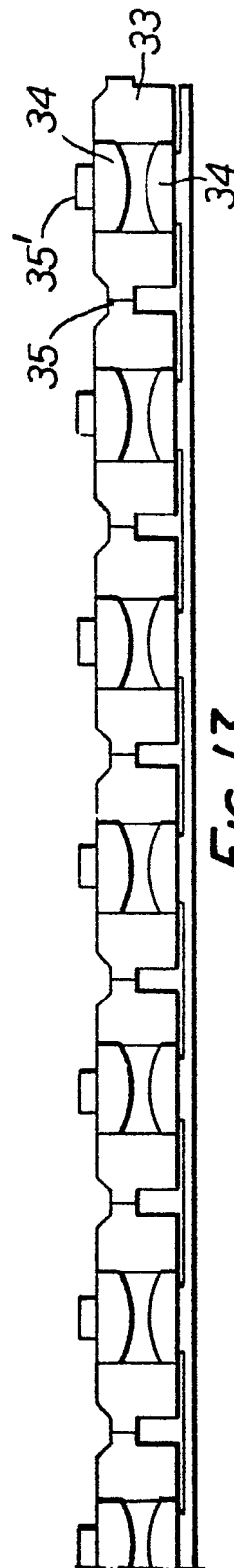


FIG. 13.

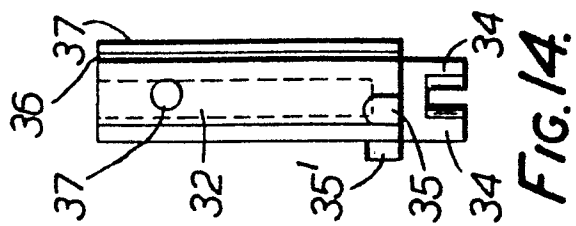
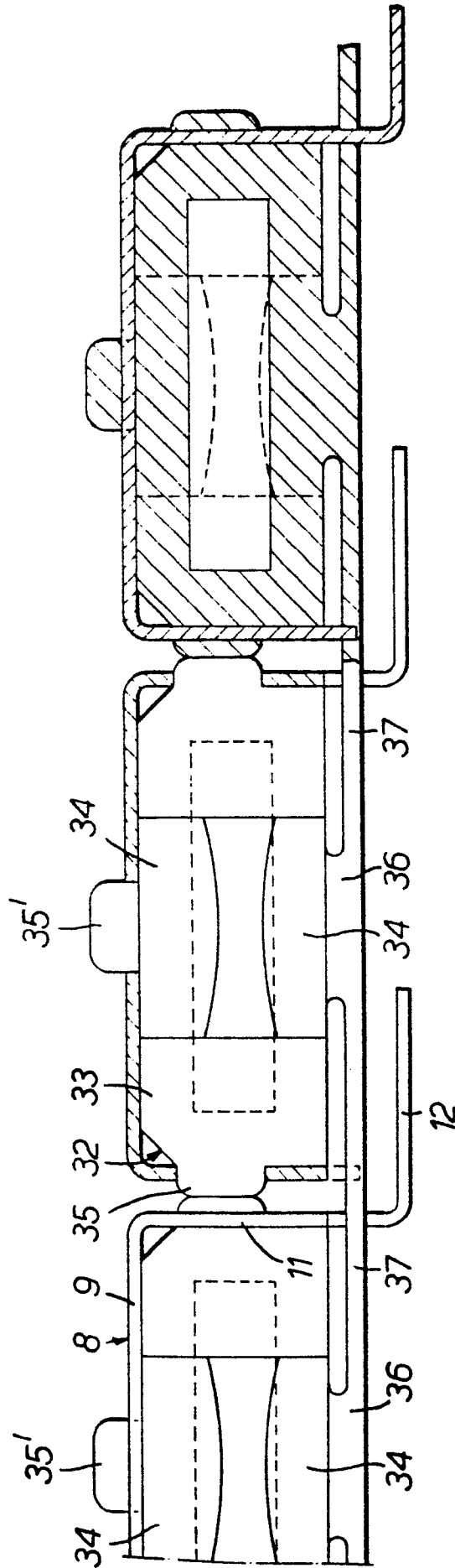


FIG. 14.





EP 85 20 1231

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. 4)
X	DE-A-2 139 375 (PITTERI) * Pages 4-6; figures 1,2 *	1,7	E 06 B 9/08
X	--- US-A-2 934 139 (WARDLAW) * Column 4, lines 35-71; figures 2,3 *	1	
A	--- FR-A-2 384 097 (PIANA) * Page 4, lines 23-40; page 5, lines 1-7, figure 4 *	2	
A	--- US-A-2 336 660 (WEST) * Pages 1-3; figures 1-7 *	1,3	

			TECHNICAL FIELDS SEARCHED (Int. Cl. 4)
			E 06 B
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 24-10-1985	Examiner VIJVERMAN W.C.
CATEGORY OF CITED DOCUMENTS			
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