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(54) **LINEAR AIR DIFFUSER**

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(73) Assignee: **E. H. Price Limited**, Winnipeg (CA)

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(52) **U.S. Cl.** **454/303**

(58) **Field of Search** 454/292, 301, 454/303, 304

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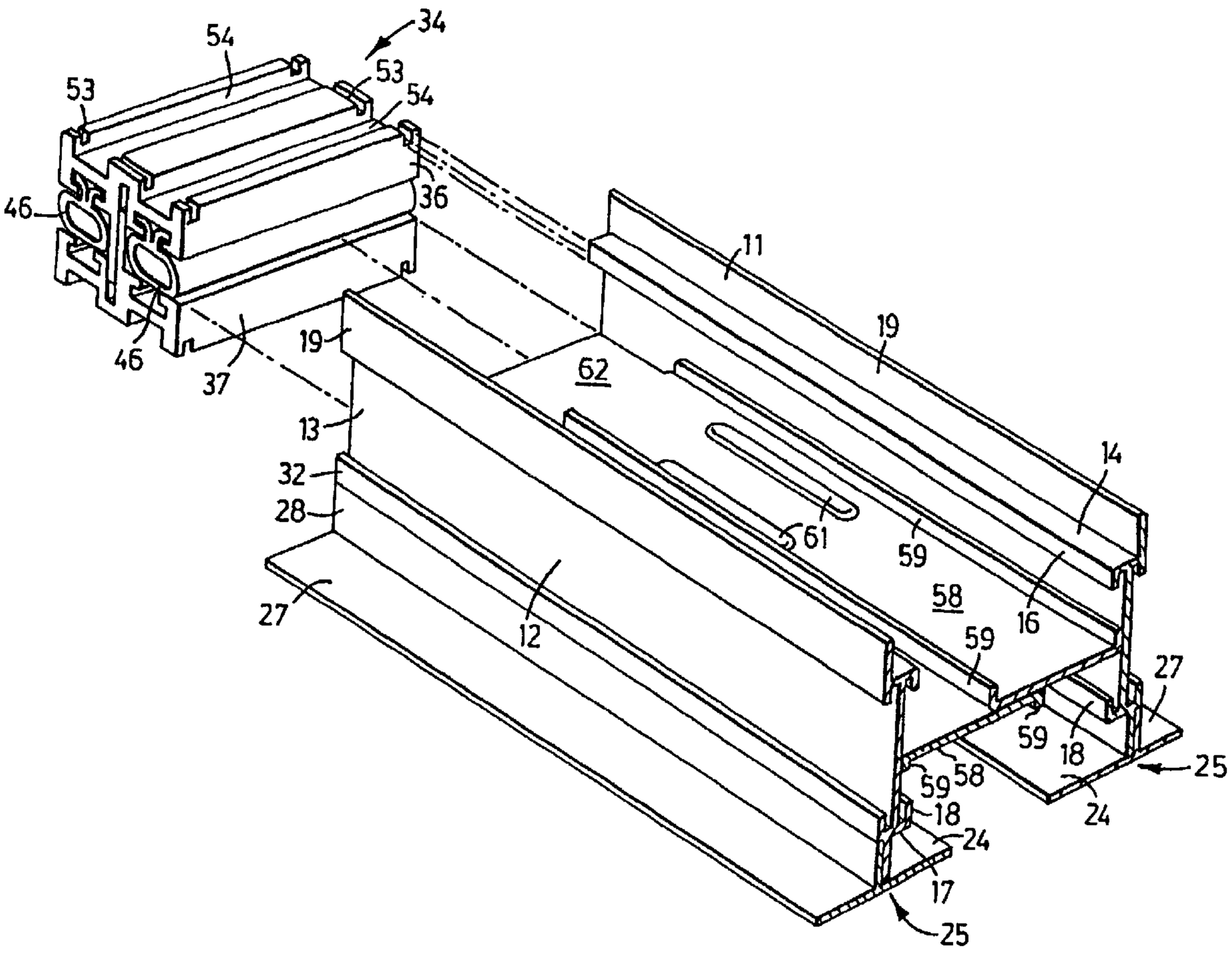
(57) **ABSTRACT**

A linear air diffuser apparatus has two parallel longitudinal rails maintained spaced by two or more transverse connectors. Two or more blade-like adjustable air flow control members extend longitudinally between the connectors. Each flow control member has a planar blade end portion at each longitudinally outer end. Each connector has an upper block and a lower block with the blade end portions received between them. One or both of the blocks has on a side facing the end portions a polymeric resiliently compressible piece that is compressed between the blocks and exerts a resilient reaction urging and gripping the end portions stably between blocks so that they are not prone to vibrate.

36 Claims, 6 Drawing Sheets



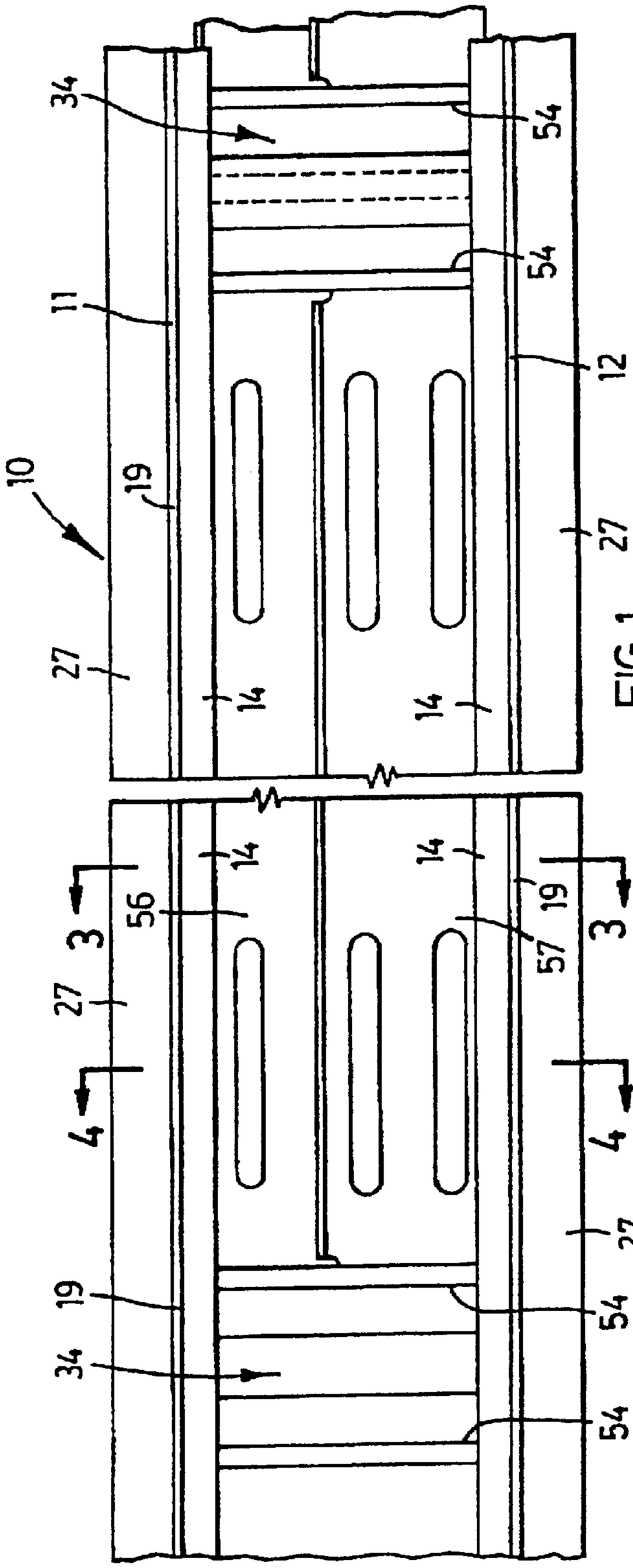

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FIG.1

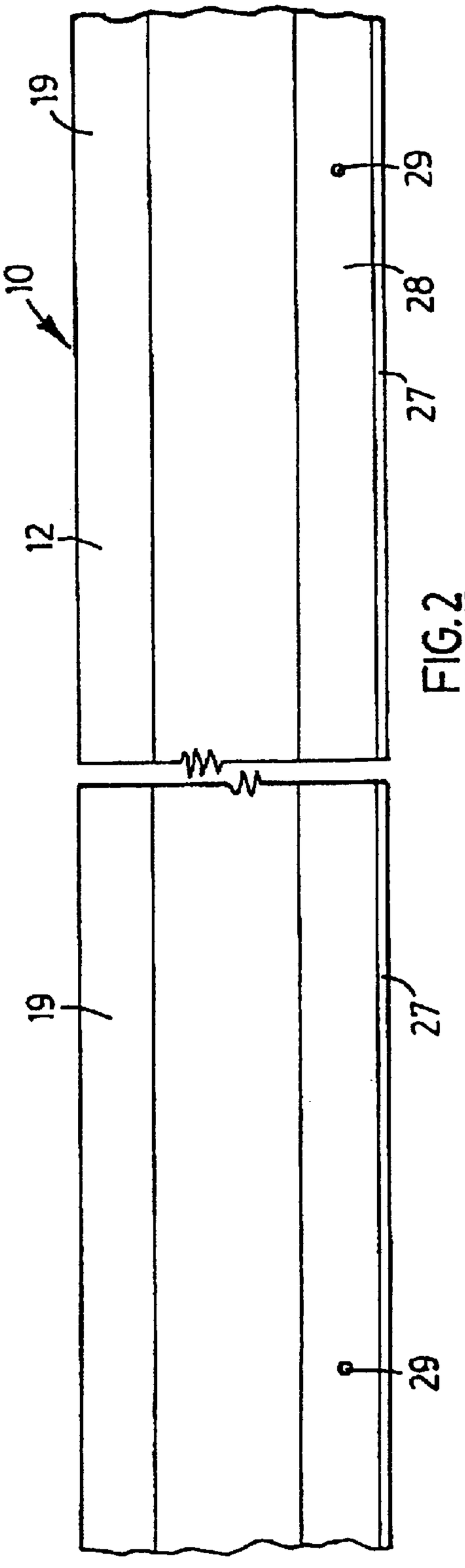
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FIG.2

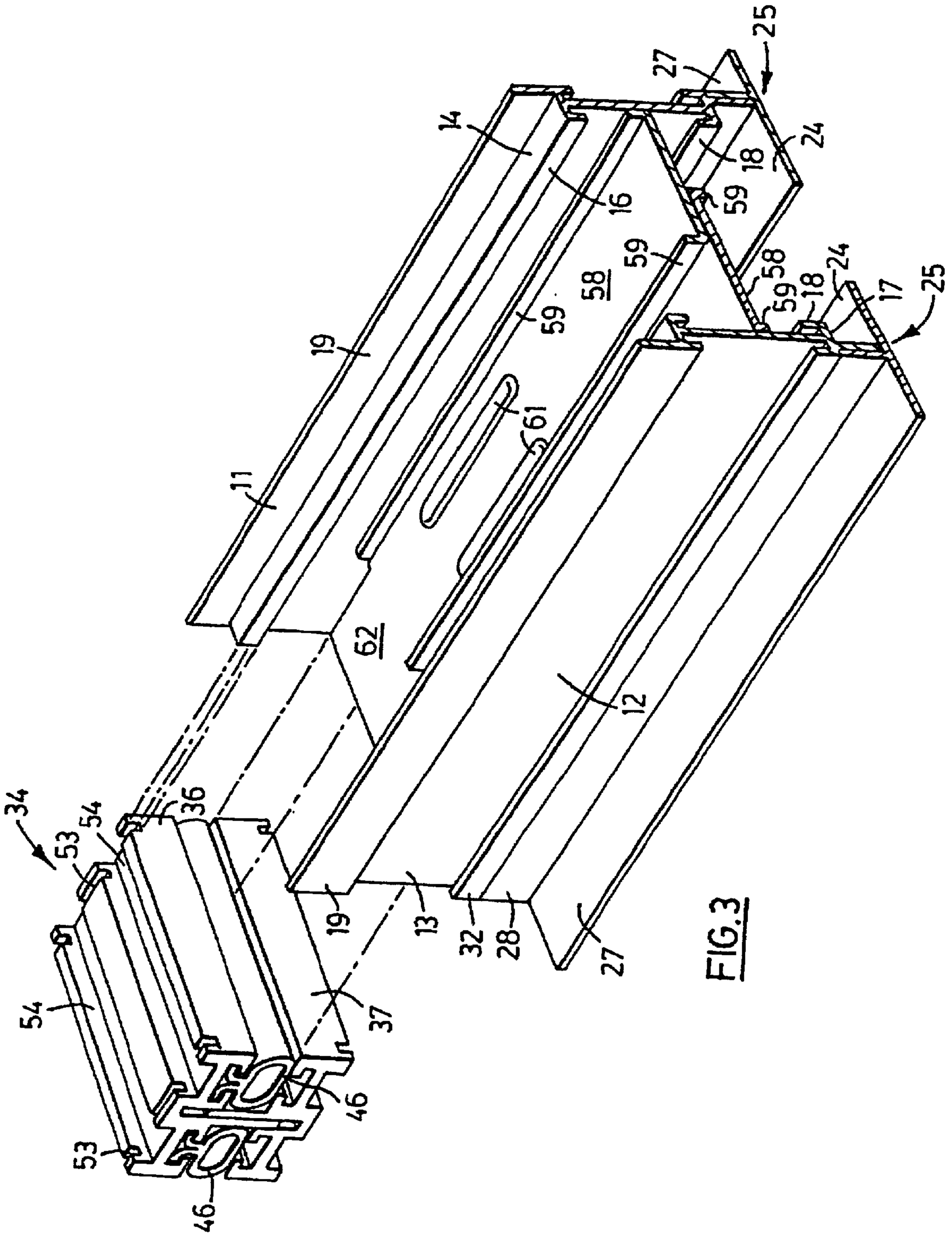
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FIG.3

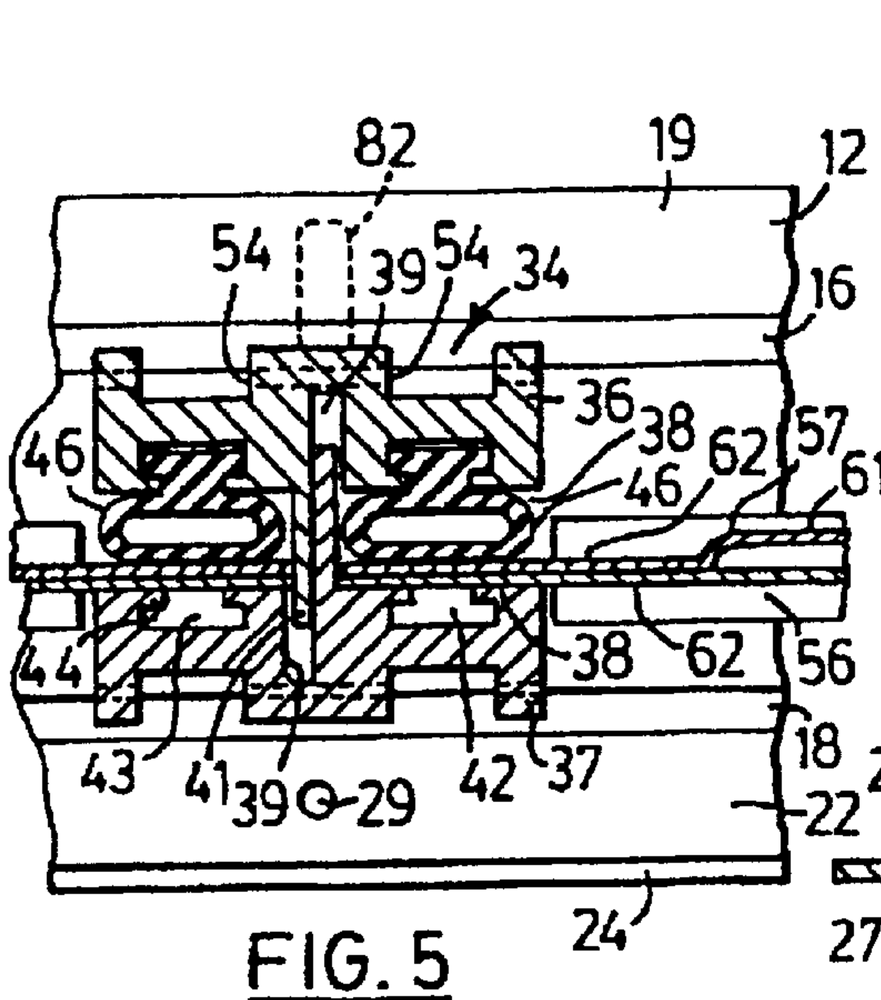

FIG. 5

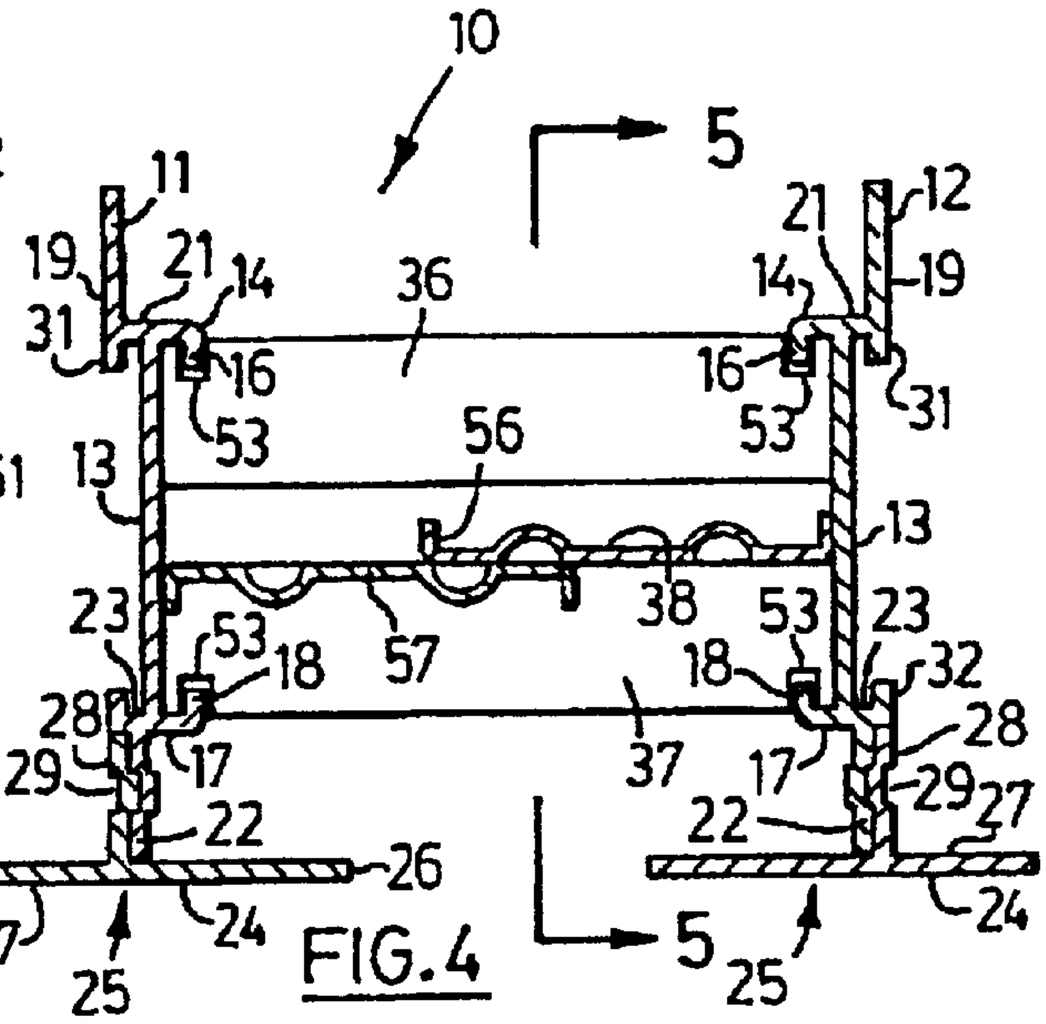

FIG. 4

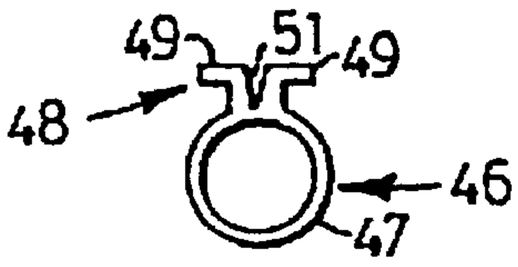

FIG. 6

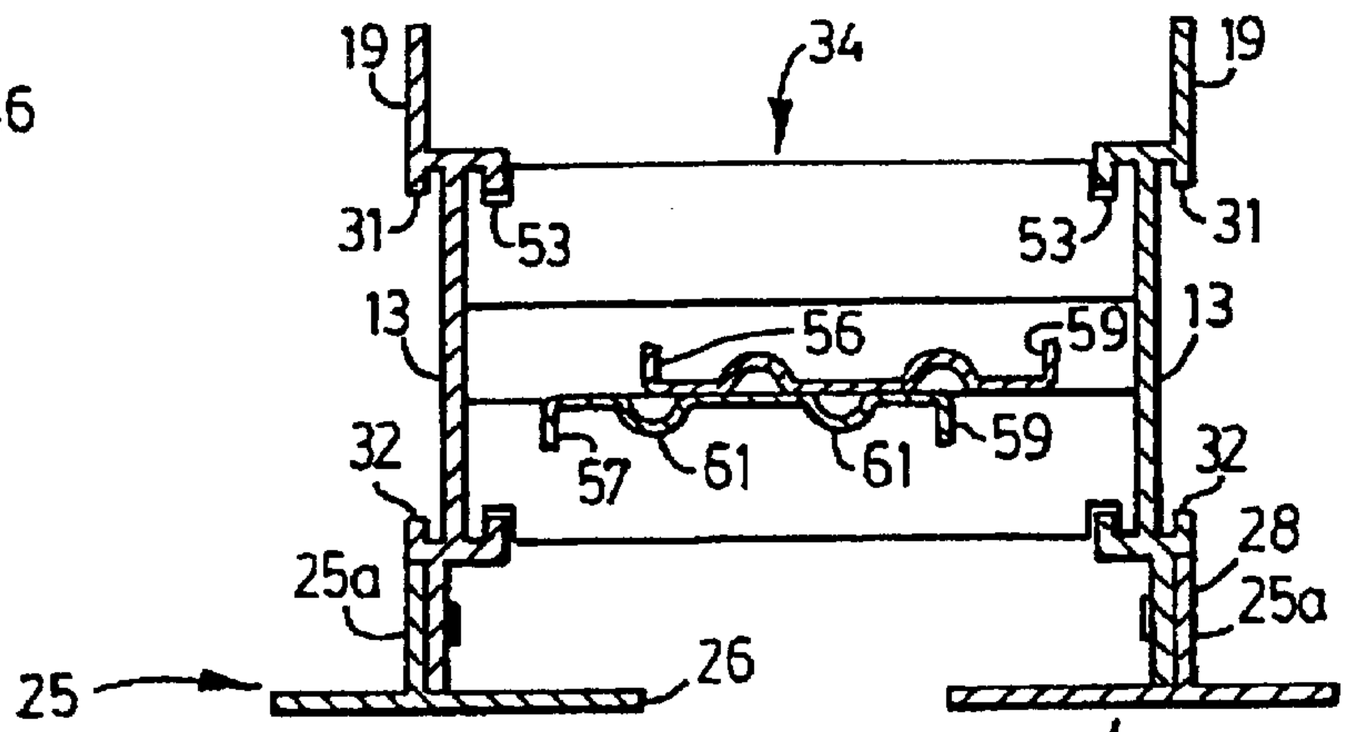

FIG. 7

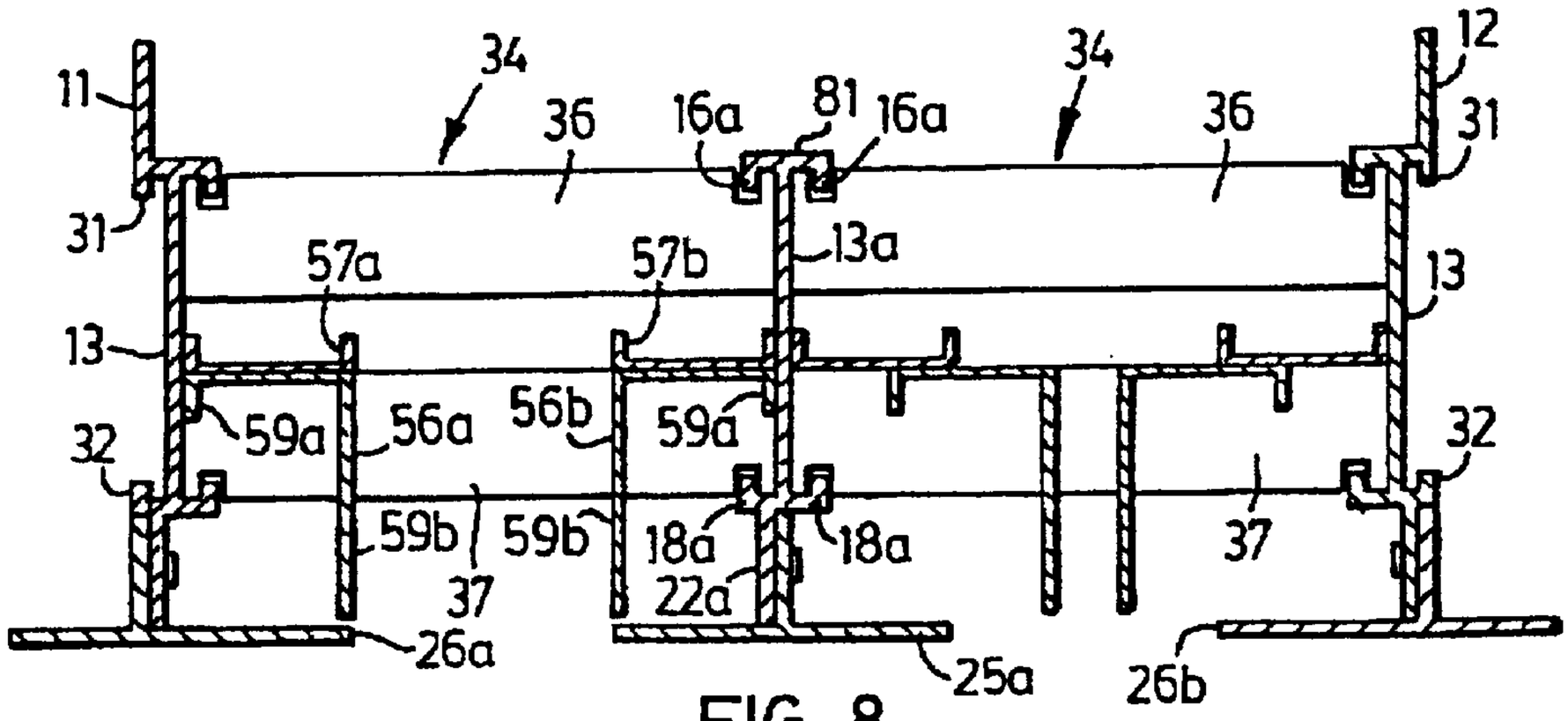

FIG. 8

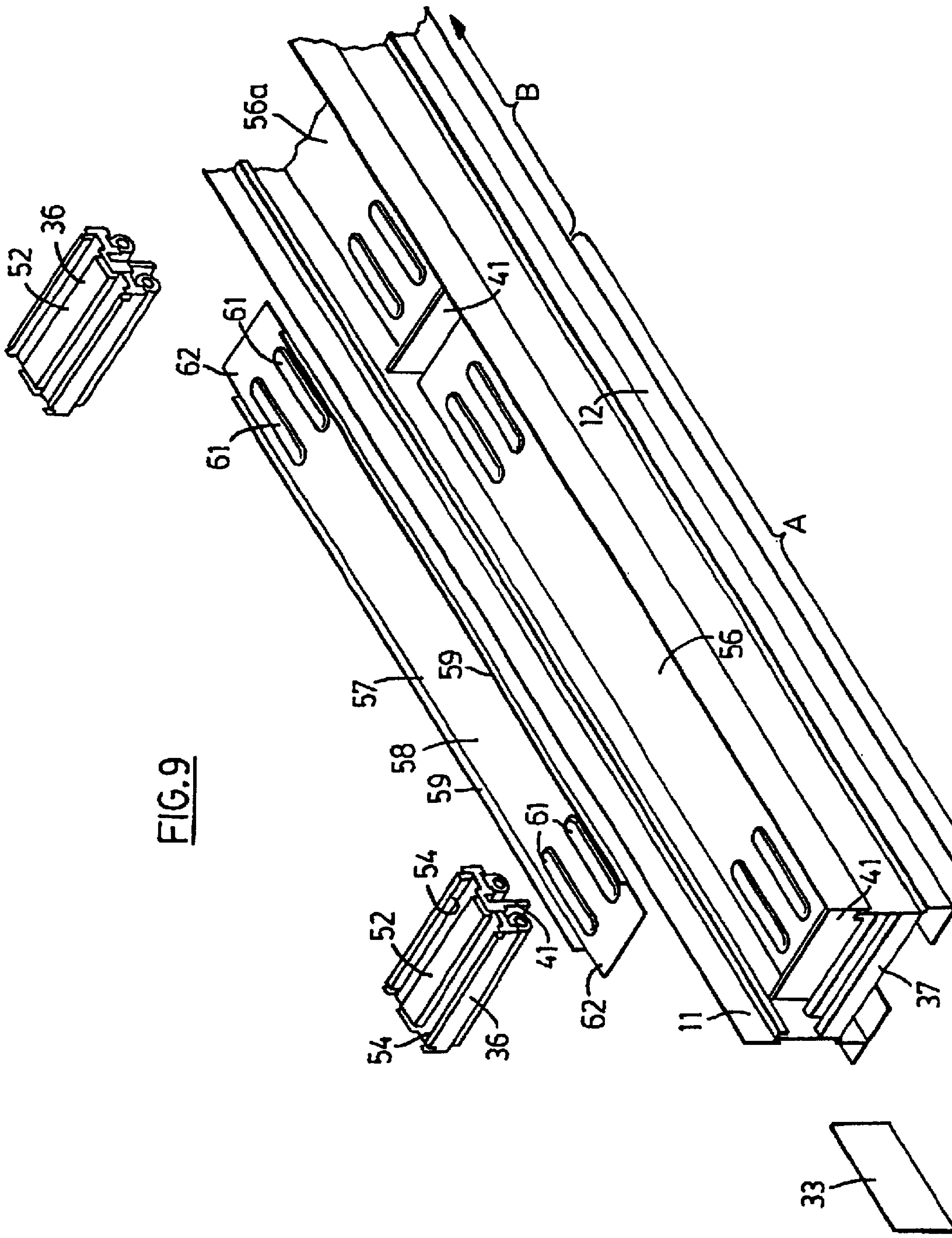

FIG.9

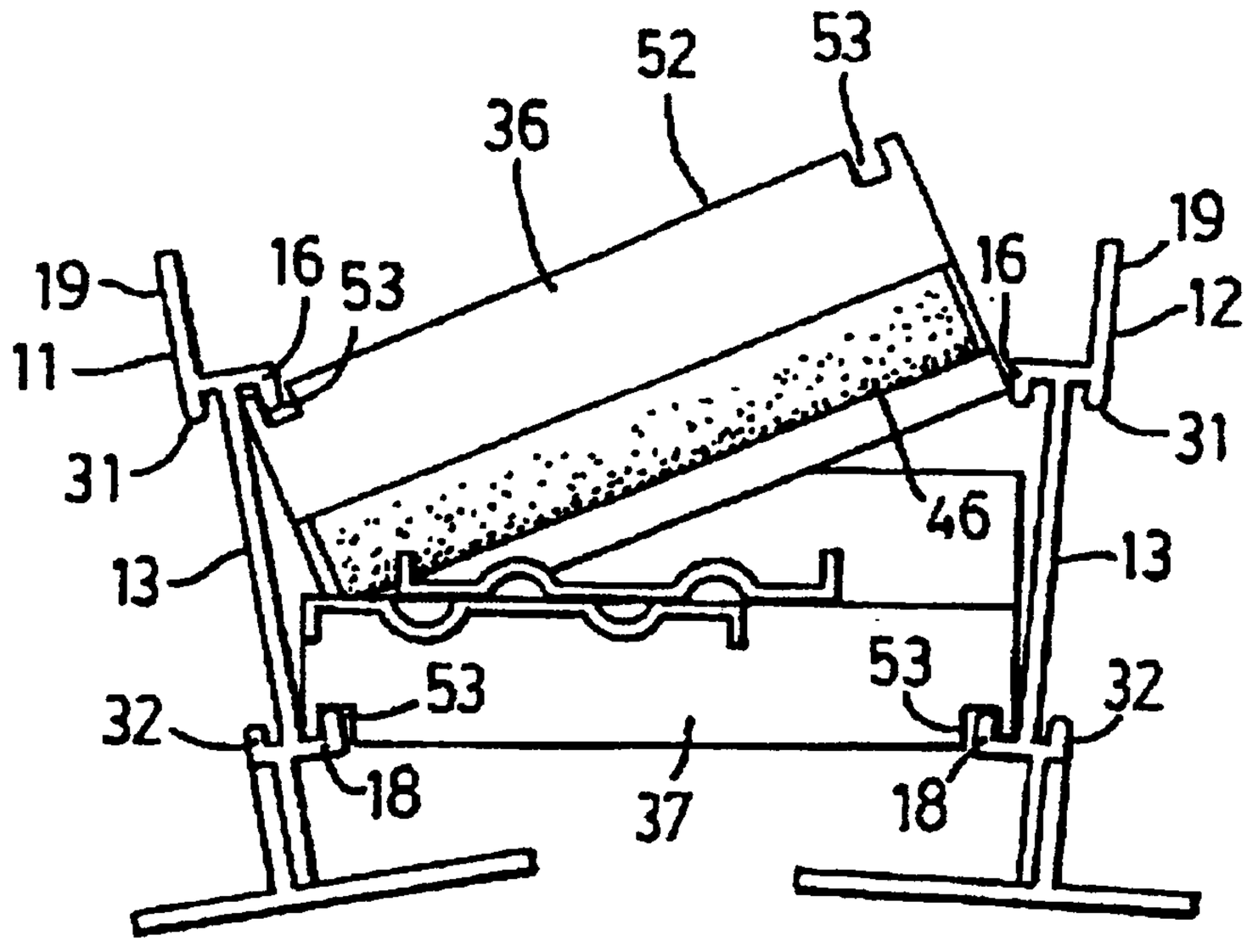
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FIG.10

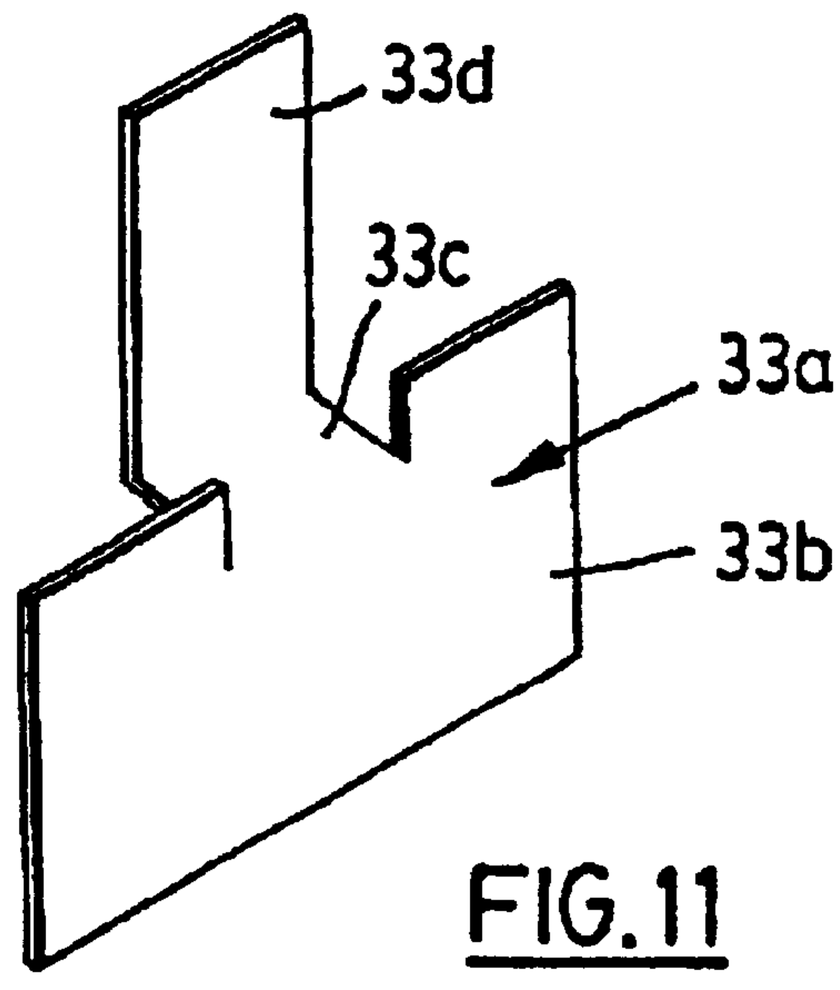
33d
33c
33a
33b

FIG.11

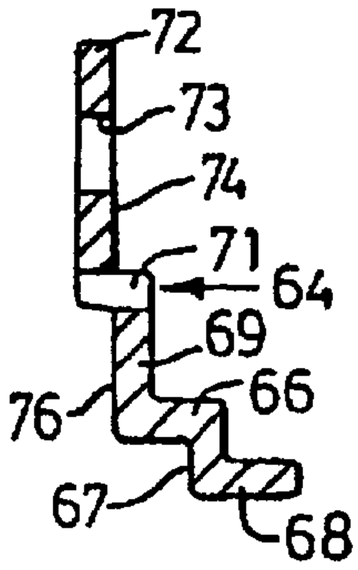

FIG.12

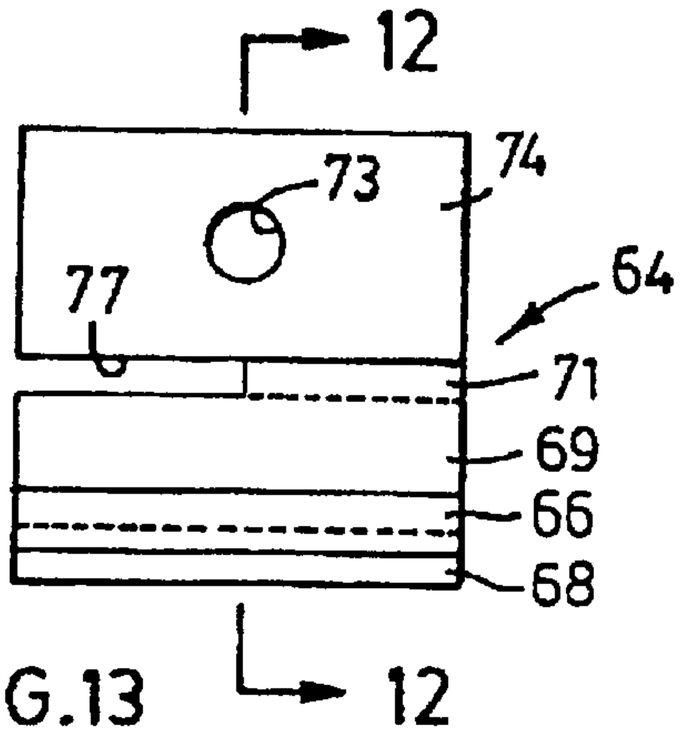

FIG.13

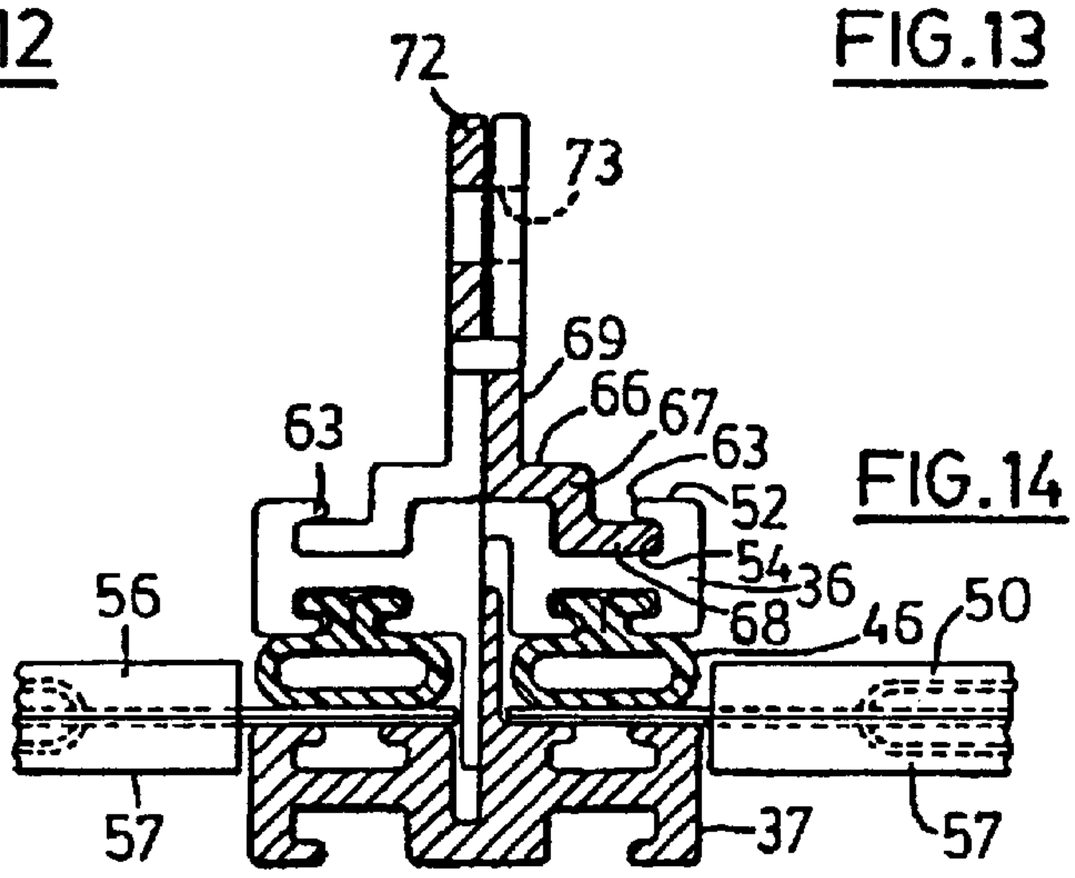

FIG.14

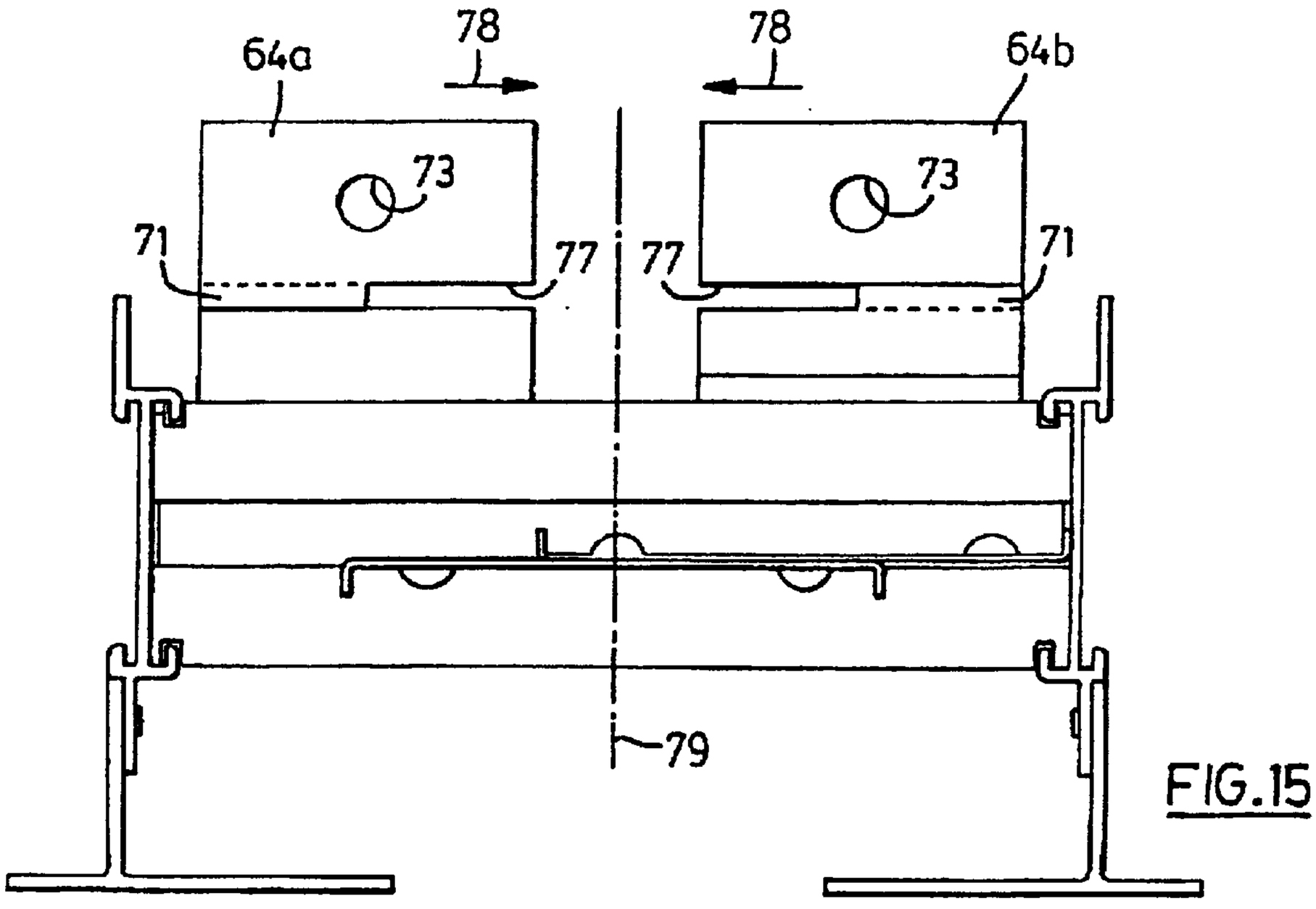

FIG.15

LINEAR AIR DIFFUSER

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates the additions made by reissue.

BACKGROUND OF THE INVENTION

The present invention relates to a linear diffuser apparatus.

Slot type ceiling linear diffuser apparatus is often incorporated in suspended ceiling systems. Linear air diffusers may for example be used along perimeter locations in particular near large window walls which are exposed to either a significantly hotter or significantly colder external environment. Window walls tend to be highly conductive, and by convection due to the resulting temperature gradient, can rapidly alter the temperature and character of diffused air flow in their vicinity. This causes non-uniform room air conditions. Linear type air diffusers can be utilized anywhere in a suspended ceiling system to achieve uniform room temperature by providing air curtains, directional air flow and air jets for rapid mixing of supply air and room air. Such diffusers usually capture within them laterally shiftable flow control members that can be adjusted to alter the position, direction or flow rate of the air flow exiting the diffuser.

Known linear diffuser apparatus of which the applicant is aware has not been as convenient as is desirable to assemble and install. Further, known linear air diffuser apparatus often gives rise to problems of vibration of the usually metal components, with resultant problems of a rattling or whistling noise nuisance.

BRIEF SUMMARY OF THE INVENTION

The present invention provides linear air diffuser apparatus comprising two longitudinal rails maintained in laterally spaced parallel condition by at least two transverse connector members each connected at its opposite ends to a respective one of said parallel rails, at least two adjustable air flow control members extending longitudinally between said connector members, each flow control member having a planar blade end portion at each longitudinally outer end, and wherein each connector member comprises an upper block and a lower block with said blade end portions received between said upper and lower blocks and at least one of said blocks provided on a side facing said end portions with a polymeric resiliently compressible engagement member compressed between the blocks and exerting a resilient reaction urging and gripping said end portions against the other of said blocks.

With this arrangement, the compression of the resilient engagement member on the planar end portions may serve to reduce air flow outwardly longitudinally, so that vibration producing air flows are reduced or eliminated, while the direct engagement of the compressible engagement member on the planar end portions provides a stable assembly that is much less prone to vibration than known arrangements. In the preferred form, the compressible engagement member may be connected as a unit to a block, so that assembly and installation of the apparatus is greatly simplified, without requiring assembly and application of small pieces that are prone to be misplaced or lost.

Further, the upper and lower blocks constituting the transverse connector members assure parallelism or straightness and adequate rigidity for the assembled linear diffuser apparatus.

BRIEF DESCRIPTION OF THE SEVERAL VIEWS OF THE DRAWINGS

FIG. **1** is a partial plan view of linear diffuser apparatus in accordance with the invention.

FIG. **2** is a side elevational view of the apparatus of FIG. **1**.

FIG. **3** is a partially exploded perspective of a portion of the apparatus of FIG. **1** taken on the arrows **3—3** in FIG. **1**.

FIG. **4** is a cross sectional elevation taken on the lines **4—4** in FIG. **1**.

FIG. **5** is a longitudinal cross section taken on the line **5—5** of FIG. **4** through the connector blocks.

FIG. **6** is an elevation of the compressible engagement member used in the assembly of FIG. **5**.

FIG. **7** is a transverse cross section similar to FIG. **4** showing adjustment of the air flow control members to a relatively open position.

FIG. **8** shows a transverse cross section through a second embodiment of linear diffuser apparatus in accordance with the invention having dual slots.

FIG. **9** is a partial perspective view of the first embodiment of the diffuser apparatus of FIGS. **1** to **8** illustrating the apparatus in the course of assembly.

FIG. **10** is an end view, partially in section, illustrating the assembly of the upper block to a lower block.

FIG. **11** is an isometric view of one form of modified form of connection plate.

FIGS. **12** and **13** are cross sectional and side elevational views of a hanger member for use with a modified form of the connector block of the diffuser of the invention, wherein FIG. **12** is a section on the lines **12—12** in FIG. **13**.

FIG. **14** is a partial cross section, somewhat similar to FIG. **5**, through a modified form of the connector block and showing application of the hanger members.

FIG. **15** is an end view, partially in transverse cross section, illustrating the modified connector block and hanger members of FIGS. **12** to **14** in the course of assembly.

DETAILED DESCRIPTION OF THE INVENTION

Referring to the drawings, wherein like reference numerals indicate like parts, a linear air diffuser **10** comprises first and second longitudinal rails **11** and **12**. Each rail **11** and **12** may be extruded, for example from aluminum.

Each rail comprises a main vertical rail portion **13** having adjacent its upper end an inwardly directed flange **14** and down turned lip flange **16** and adjacent its lower end an inwardly directed flange **17** with an upturned lip flange **18**.

An upper rail portion **19** is offset slightly outwardly from the main portion **13** and is connected thereto by a connector flange **21**. The flange **21** provides a ledge on which a plenum chamber may be seated.

A lower rail portion **22** is also offset slightly outwardly from the main rail portion **13**, and is connected thereto by a connector flange **23**.

Each flange **11** and **12** has connected on its lower edge an inverted T section rail **25**, preferably extruded for example from aluminum. The T rail **25** includes a horizontal flange **24** which extends inwardly from the lower rail portion **22** to provide a lower air outlet slot **26** somewhat narrower than the spacing between the rail portions **13**. Preferably, the T rail **25** includes a flange **27** that extends outwardly from the lower rail portion **22**, to provide a horizontal surface for reception of T bars, ceiling tiles and like elements of ceiling structures.

In the preferred form, the inner face of the flange **28** of the T section rail **25** is secured on the outer face of each lower rail portion **22** and is clinch-locked thereto by means of small circular portions **29** of the flange **28** and of the rail portions **22** that are struck inwardly to provide a rivet-like connection at intervals.

In the preferred form, the connection flange **21** has a down turned outer portion **31** parallel to and spaced outwardly from the main rail portion **13**, and preferably aligned with the upper rail portion **19**, and the lower connection flange **23** has an upturned flange **32** spaced similarly from the outer flank of the main rail portion **13**. Preferably the flanges **28**, **32**, **31** and **19** are all in vertical alignment to provide flush surfaces against which ceiling elements such as T bars may be abutted.

A rectangular connection plate **33**, shown in FIG. **9**, may be used to connect co-linearly lengths of rails such as rails **11** and **12**. The width of the plate **33** is slightly less than the spacing between the outer generally C-shaped recesses formed between on the one hand between the outer side of the main rail portion **13**, connection flange **21** and down turned flange **31** and on the other hand between the outer side of the main rail portion **13**, connection flange **23** and upturned rail **32**, so that the plate **33** is snugly received. Connection plate **33** may be used on each side of the diffuser apparatus to connect longitudinally between rails similar to the rails **11** and **12** in order to provide increased length for the rails **11** and **12** and for the linear diffuser.

The rails **11** and **12** are maintained in spaced parallel arrangement by transverse connector members **34**. As best seen in FIGS. **3**, **5** and **9**, each connector member **34** comprises an upper block **36** and a lower block **37**. Preferably, the blocks **36** and **37** are relatively sturdy and each may be a length served from an extrusion, for example an aluminum extrusion. The blocks **36** and **37** may be similar, and severed from a common extrusion, as shown, or may be of different cross-sections.

Each block **36** and **37** is generally rectangular in form, and has a generally planar inner face **38** in approximately the center of which is a transverse outwardly extending slot **39**. In the examples shown, the slot **39** is slightly offset toward one end of each block, and adjacent to the slot **39** and offset therefrom toward the other end of the block is a transverse outwardly extending plate member in the form of a tongue **41**, so that, when one block **36** is inverted with respect to the other block **37** and the blocks are applied together face to face, the tongue **41** of one block is received within the slot **39** of the other block.

Since the blocks **36** and **37** are in the preferred form extrusions, as will be appreciated, the slots **39** and tongues **41** run the full length of the blocks **36** and **37**.

Longitudinally outwardly from each side of the tongue **41** and slot **39** the planar inner face **38** is further interrupted by a channel formation with re-entrant edges, that is to say a C-shaped channel **42**. Each of these channels has a channel bottom **43** and inward or re-entrant edge flanges **44**.

At least one of the blocks **36** and **37**, and, optionally both blocks **36** and **37**, are provided with a pair of resiliently compressible engagement members received in the re-entrant edge channels **42**. These engagement members **46** are captured in the said channels **42** in and protrude inwardly beyond the plane of the inner face **38**. In the preferred form, as seen in FIG. **6**, each engagement member **46** comprises an open-ended tubular engagement portion **47** having on one side a generally T-shaped base **48** formed from two L-shaped ear portions **49** separated by a V-shaped notch **51**.

In manufacture, the portions **49** are compressed together and slid lengthwise into the channels **42**. The outwardly directed resilient reaction firmly retains the L-shaped portions **49** seated and captured in the re-entrant portions of the channel **42** adjacent the channel base **43**. The engagement member **46** is preferably formed from a relatively stiffly resiliently flexible polymer, for example cured or vulcanized natural or synthetic rubber, or a similar elastomeric materials, such as a vinyl polymer rubber blend.

As will be appreciated, the length of the block members **36** and **37** of the connector members **34** determine the lateral spacing of the rails **11** and **12**, and, in the assembled condition, the outer ends of the block members **36** and **37** abut the inner sides of the main rail portions **13**.

Adjacent each laterally outer end, each block portion **36** and **37** is formed on its outer face **52** with a longitudinally extending kerf or groove **53**. Each groove **53** is spaced inwardly from the adjacent end of the block **36** or **37** a distance equal to the inward spacing of the down turned and upturned flanges **16** and **17** from the inner face of the main rail portion **13** of each side rail **11** and **12**.

As will be appreciated, each groove **53** may be formed by cutting or machining transversely across each extrusion piece in the case in which the blocks **36** and **37** are pieces severed from an extrusion.

Preferably, the outer face **52** of the blocks **36** and **37** are formed with transversely extending grooves **54** that may serve to reduce the mass of the blocks. In the case of the embodiment of FIGS. **1** to **7**, **9** and **10**, as well as in the embodiment of FIG. **8**, these grooves **54** may be generally rectangular, as best seen in FIG. **5**.

The linear air diffuser apparatus further comprises blade-like adjustable air flow controller members, indicated by reference numerals **56** and **57** in FIGS. **1** to **7**, **9** and **10**. The two members **56** and **57** may be similar or identical to one another. Each may be stamped from, for example, sheet steel. In the example shown, each comprises a generally rectangular planar main or central portion **58** which may be of shallow channel section having squat channel sides **59**. Adjacent each end, each member is formed with a pair of elongated finger grip portions **61** with rounded ends that are embossed upwardly in the direction in which the channel sides **59** extend.

Longitudinally outwardly from the embossed portions **61** each member **56** and **57** comprises a planar end portion **62** that in the preferred form is generally rectangular, slightly narrower than, and of the same thickness as the central portion **58** of the member **56** or **57**, and has smoothly planar upper and lower sides.

In the assembled condition, as best seen in FIG. **5**, these planar end portions **62** are firmly retained by being gripped compressively between the upper face of the lower block **37** and the engagement member **46** of the upper block **36**.

In use, the elements described above may be employed for assembly of a diffuser apparatus having separately controllable or adjustable air distribution sections along its length. Each such section is defined by at least a pair of the flow control members **56** and **57** confined at each end by engagement in a transverse connector **34** each comprising an upper block **36** and a lower block **37**. For example, as seen in FIG. **9**, one such section is indicated at A, while an adjacent section indicated at B comprises further blade like flow control members that may be similar to or different from members **56** and **57**, of which one blade member **56**a is seen in FIG. **9**. Usually, a linear air diffuser formed from the structure of the present invention, and comprising one or

more sets of rails **11** and **12** joined by connection plates **33**, will comprise a multiplicity of such sections. Each section or a number of adjacent sections may be provided with its own or their own air inlet service. Usually, air inlet to the diffuser section is provided by a box-like plenum structure secured in generally conventional air tight manner to the upper side of a connector member **34** and seated within the upper side of the rails **11** and **12**. In this way, air having different characteristics may be supplied from adjoining sections. For example, it may be desired to provide relatively warm air through section A and relatively cooler air through section B.

In assembling the air diffuser, the lower blocks **36** are engaged with the rails **11** and **12** by hooking the upturned lip flange **18** of firstly one rail **11** and then the other rail **12** into the grooves **53** of the lower block member **37**, as seen in FIG. **4**. The blocks **37** are spaced apart along the length of the diffuser at standard center spacings corresponding to the standard lengths of the flow control members **56** and **57**. The flow control members **56** and **57** are then applied on the upper side of the blocks **37**, with the planar end portion **62** lodging on the upwardly facing inner side surfaces **38** of the lower blocks inwardly from the tongue portions **41**.

The members **56** and **57** are preferably inverted with respect to one another, so that the outer sides of the channels are in engagement, as seen in FIG. **4**.

The upper blocks **36** are then applied, as seen in FIGS. **9** and **10**. A downwardly turned lip flange **16** of one rail, for example rail **11** and seen in FIG. **10** is first hooked into the grooves **53** at one end of the upper block **36**, and the rails are then upwardly tilted outwardly with respect to one another, as seen in FIG. **10**, and pressure applied on the upper face **52** of the upper block **36** to compress the engagement member **46** somewhat beyond the state of compression shown in FIG. **5** until the upper face **52** of the upper block **36** extends a little below the lower end of the down turned lip flange **16**, at which point the flange **16** can snap into the groove **53**. Pressure on the upper block **36** may then be released so that the engagement members **46** expand somewhat to the normal or installed conditions seen in FIGS. **4** and **5**.

The rails **11** and **12** have sufficient flexibility to allow upper blocks **36** to be installed progressively at points spaced along the length of the linear diffuser.

In the installed position, as seen in FIGS. **4** and **5**, the resilient reaction of the compressed members **46** acting between the blocks **36** and **37** through the superimposed blade end portions **62** urges the blocks **36** and **37** vertically apart so that the portions outwardly and upstanding with respect to the grooves **53** are lodged tightly within the inner channel recesses defined between the down turned lip flanges **16** and the inner side of the main portion **13** at the upper region and between the upturned lip flanges **18** and the inner side of the main portion **13** at the lower region. This secures the rails **11** and **12** to the connector members **34**. Since the blocks **36** and **37** are relatively sturdy and of substantially constant cross-section except at the shallow grooves **53**, they provide a connection between the rails **11** and **12** of exceptional strength and stability.

The resilient reaction between the engagement members **46** of the blade end portions **62** retains the portions **62** pressed firmly against the inner face **38** of the lower block **36**. Since the portion **62** and face **38** are planar, the pressure of the members **46** retains the portions **62**, usually at least partially superimposed, stably in tightly compressed condition of the face **38** and sufficient pressure can be exerted by the member **46** that there is no tendency for the members **62** to vibrate relative to one another or relative to the face **38**. Hence rattling, whistling or other noises can be avoided.

After the air diffuser apparatus has been installed in a ceiling, adjustment of the positioning of the flow controlling members **56** and **57** may be made from below the ceiling when desired, for example for the purpose of adjusting different sections to provide different types or directions of air flow. For example the members may be adjusted from the position shown in FIG. **4** to the position shown in FIG. **7**. Such adjustments are carried out by inserting the finger tips or a tool upwardly through the slot **26** and shifting the members **56** and **57** laterally to the desired positions. The resilient reaction of the resilient engagement members **46** with the planar end portions **62** allows the end portions **62** to slide relative to one another and relative to the engagement members **46** and blocks **36** and **37** on application of moderate lateral pressure. The embossments **61** and channel sides **59** provide laterally facing surfaces against which lateral finger tip or tool pressure may conveniently be applied.

Since the members **46** can be pre-assembled to the blocks **36**, to provide a unit having the members **46** captured therein, the parts of the diffuser can be supplied to installers without small loose parts that may become lost or mislaid and that may tend to inconvenience or delay the work of the installers.

Preferably, each engagement member **46** is of open cross-section, for example is tubular in form, as seen in FIG. **6**, so that it is resiliently compressible. Other forms of gas containing engagement structure are, of course possible, such as engagement members formed from expanded or foam rubber, resilient plastic or resilient natural or synthetic elastomer, or the like.

In the preferred form, the engagement members **46** function as air-excluding gaskets, and extend continuously transversely substantially the entire distance between the rails **11** and **12**. Preferably, the gasket-like resiliently compressible engagement member **46** extends a length at least 90% and more preferably at least about 95% distance between the rails **11** and **12** or the length of the block member **36**. In this manner, the engagement member may effectively prevent flow of air longitudinally outwardly from the region of the opposed end portions **62** of the flow controlling members **56** and **57**.

One advantage of the arrangement wherein the upper rail **13** and T section rail **25** are separate pieces united together, for example by clinch locking, is that the upper rails **13**, as well as the blocks **36** and **37**, the flow control members **56** and **57** and the engagement members **46**, may be black or may be finished black, so they are readily seen from below, while the visible lower rail portion **25** may be finished a lighter color, for example white or any other color desired for a given ceiling constructions. Further, it facilitates the use of various different profiles of lower rail portion **25** to suit varying ceiling integration requirements. Moreover, curved diffuser sections are also more easily achieved by rolling and matching upper rails **13** and lower rails **25** to specified radii in concave or convex fashion.

As noted above, the diffuser may comprise a number of sets of the rails **11** and **12** joined co-linearly by connection plates **33**. Modified forms of the connection plates **33** may be used to make connections to structural components such as ceiling support channels. An example of one such modified connection plate **33**a is shown in FIG. **11** and comprises a rectangular plate body **33**b similar to plate **33** adapted to be slid snugly endwise in the outer C-shaped recesses above

referred to and defined by the rail portions **13** and flanges **26** and **31** at the upper region and **23** and **32** at the lower region of each rail such as rails **11** and **12**. A portion **33**c extends a distance below the upper edge of the plate **33**b longer than and hence laterally below the upper flange **31** and outwardly a distance longer than the spacing between the flange **31** and the outer side of rail **13** and connects with an upwardly extending portion **33**d extending upwardly above the upper edge of the plate body **33**b a distance greater than the upper rail portion **19** so that the upper portion of the upwardly extending portion **33**d may be used to make connections to structural components such as ceiling support channels. The connection plates **33**a may be used to make a bridging connection between juxtaposed ends of sections of the rails **11** and **12**, or may be slid endwise in said C-shaped recesses to positions intermediate the ends of the rails **11** and **12**, so that a number of the connection plates may be used to make a connection to a single length of the diffuser structure, if desired.

The diffuser may be retained and supported in a ceiling structure, such as a conventional ceiling structure by usual attachment and suspension arrangements, for example fastener members connected to the upper rail portions **19** and connected to fixed portions of the building structure in a generally conventional manner, or by making connection to connector plates **33**a as described above with reference to FIG. **11**.

In a further preferred form, a novel form of suspension structure illustrated in FIGS. **12** to **15** is employed.

In this example, the blocks **36** and **37** are modified in that the transverse channels **54** on the outer sides of the blocks are re-entrant on one side, for example the longitudinally outer side, as seen in FIG. **13**, wherein a re-entrant lip flange **63** is shown.

A pair of hook-in generally plate form hanger members **64** is employed. As seen in FIGS. **12** and **13**, each hanger member **64** comprises a planar base portion **66** for seating on the outer face **52**, a leg portion **67** extending downwardly the depth of the channel **54**, and a lower hook-in plate portion **68** connected on the lower end of the leg **67** and extending substantially the width of the channel **54**, so that the plate portion **68** can be hooked into the channel **54** by inclining it relative to the plane of the outer side **52** and then rocking it inwardly and downwardly to the position seen in FIG. **13**. An intermediate plate portion **69** extends upwardly from the base and connects through a horizontal transition flange **71** to an upwardly extending upper flange portion **72** provided with a central opening **73**. The longitudinally outer face **74** of the flange **72** is substantially coplanar with the longitudinally inner face **76** of the intermediate plate portion **69**.

A transversely extending recess **77** is formed through the transition flange **71** and extends preferably half way along its length, as seen in FIG. **13**.

In use, a pair of the hook-in members **64**a and **64**b, arranged in opposition to one another as seen in FIG. **14** is hooked into the channels **54**, each with their recesses **77** extending inwardly and toward the other as seen in FIG. **15**. The members **64**a and **64**b are then slid toward one another from the spaced condition of FIG. **15** in the directions indicated by the arrows **78** in FIG. **15** until the openings **73** are in register, preferably in alignment with the center line **79**. In this position, each member **64**a and **64**b has its upper portion **72** on a side of the other member opposite to that side on which its intermediate portion **69** lies, and the two members **64**a and **64**b are locked together with the transition flange portion **71** of each member **64** received in the recess **77** of the other member, as seen in FIG. **14**. A hanger connection can then be made to the aligned openings **73** for supporting the diffuser structure relative to a ceiling structure.

It will be appreciated that the principles of the above linear diffuser structure are readily adaptable for multiple-slot diffuser structures. Such structures may comprise two or more slots side by side and will comprise in addition to the outer rail **11** and **12** one or more intermediate rails parallel to the outer rails **11** and **12**, with connectors such as connector **34** bridging between each outer rail **11** or **12** and an adjacent intermediate rail, and between adjacent intermediate rails if there are two or more intermediate rails. An example is seen in FIG. **8**, wherein an intermediate rail **81** is employed having a main rail portion **13**a, down turned lip flanges **16**a and upturned lip flanges **18**a for forming bridging connections to the block members **36** and **37** in the manner described above in detail in connection with FIGS. **1** to **7**, **9** and **10**, and having a lower rail portion **22**a to which a slot defining T-shaped member **25**a may be clinched-locked in the example shown to provide two relatively narrow outlet slots **26**a and **26**b side by side.

Further, as will be appreciated, the flow control members **56** and **57** described above in detail are merely exemplary of various flow control members that may be employed. Numerous profiles of linear diffuser flow control members are known in the prior art and all such profiles may be employed with the apparatus of the invention requiring only that the members should be modified to provide them with planar end extensions similar to the end portions **62** illustrated for the members **56** and **57** with reference to FIG. **9** above, so that these can be retained in the manner described above in detail with reference to FIG. **5** of the drawings.

For example, FIG. **8** shows an arrangement wherein each slot is provided with four flow control members comprising two upper shallow channel section members **57**a and **57**b and two lower blade members **56**a and **56**b. Each member **56**a and **56**b has on its laterally outer edge a relatively shallow channel side portion **59**a, while on the inner side, the side portion **59**b is greatly elongated, whereby adjustment of the flow control members **59**b, as illustrated, for example by the different degrees of adjustment illustrated in the left hand and right hand slots in FIG. **8**, for example the nature or direction of the flow of air can be adjusted significantly.

Numerous other configurations and arrangements of flow control members may be employed.

Other modifications of the structure are possible.

For example, instead of each block member **36** and **37** having an integral tongue **41** and a recess **39**, each member may be provided with only a transversely extending longitudinally generally central recess, so that the recesses are vertically aligned when the blocks **36** and **37** are superimposed. In this case, in the course of assembly of the diffuser structure, after engaging the lower block members with the rails **11** and **12** a rectangular plate member of thickness such that it is snugly received in the recess in the lower block **37**, and of length equal to the length of the blocks **36** and **37** is inserted into the recess in the lower block member following which the blade-like flow control members **56** and **57** and the upper blocks **36** are applied so that the plate members enter the recess of the upper blocks.

As with the tongues **41**, the plates serve as non-rotatable vertical guide means preventing lateral shifting or rotation of one block **36** or **37** relative to the other about a transverse axis as may tend to be caused by the resilient reaction of the members **46**.

Upper blocks **36** may be formed from an extrusion different from lower blocks **37**. For example upper blocks **36** may be formed with a fin **82** shown in broken lines in FIG. **5** through which openings may be made to provide an attachment point for support wires or other support members.

I claim:

1. Linear air diffuser apparatus comprising two longitudinal rails maintained in laterally spaced parallel condition by at least two transverse connector members each connected at its opposite ends to a respective one of said parallel rails, at least two adjustable air flow control members extending longitudinally between said connector members, each flow control member having a planar blade end portion at each longitudinally outer end, and wherein each connector member comprises an upper block and a lower block with said blade end portions received between said upper and lower blocks and at least one of said blocks provided on a side facing said end potions with a polymeric resiliently compressible engagement member compressed between the blocks and exerting a resilient reaction urging and gripping said end portions against the other of said blocks.

2. Apparatus as claimed in claim **1** wherein said engagement member extends continuously substantially the entire length of the distance between the rails.

3. Apparatus as claimed in claim **1** wherein each engagement member is captured in a transversely extending recess in said at least one block.

4. Apparatus as claimed in claim **3** wherein the recess is C shaped and the engagement member has on one side a pair of longitudinally outwardly directed ears received in said C shaped recess.

5. Apparatus as claimed in claim **1** wherein the engagement member is tubular.

6. Apparatus as claimed in claim **1** wherein each rail has on an inner face a downwardly open channel recess at an upper region and an upwardly open channel recess at a lower region and each block having an upstanding portion adjacent each end, and a resilient reaction exerted by said engagement member lodges each said upstanding portion in a respective adjacent channel recess.

7. Apparatus as claimed in claim **6** wherein each said upstanding portion is defined between a longitudinally extending groove formed in a vertically outer face of the block and an adjacent end surface of the block.

8. Apparatus as claimed in claim **1** wherein each block comprises a length severed from an extrusion.

9. Apparatus as claimed in claim **1** wherein each one of said blocks has a transversely extending recess in an intermediate region, said recesses each receiving a vertically extending plate member secured non-rotatably relative to the other block.

10. Apparatus as claimed in claim **9** wherein each block is formed with an integral vertically outwardly extending tongue constituting said plate member.

11. Apparatus as claimed in claim **1** wherein an upper side of each upper block is formed with a pair of transversely extending channels.

12. Apparatus as claimed in claim **11** wherein a side of each transversely extending channel is provided with a re-entrant lip flange that retains a hook-in hanger member.

13. Apparatus as claimed in claim **12** wherein said re-entrant lip flange is on a longitudinally outer side of each channel and said hanger member comprises a pair of hanger elements each having an upper portion offset from an intermediate portion, a laterally extending recess and a transition portion between said upper and intermediate portions, each upper portion having an opening therethrough, and said elements sliding from a spaced condition to an aligned condition wherein the openings are in register and the upper portion of each element is disposed on a side of the other element opposite a side that said intermediate portion is disposed on, with a transition portion of each element received in the recess of the other element.

14. Apparatus as claimed in claim **1** comprising a separate inverted T-section piece connected to a lower end of each said longitudinal rail.

15. Apparatus as claimed in claim **14** wherein each T-section piece comprises an upper clinch-locked to each said longitudinal rail.

16. Apparatus as claimed in claim **14** wherein each said longitudinal rail is finished black and each T-section piece is finished a lighter color.

17. Apparatus as claimed in claim **1** wherein each said longitudinal rail has on an outer side a C-shaped recess receiving at least one connection plate.

18. Apparatus as claimed in claim **17** wherein said connection plate includes a portion extending laterally outwardly and upwardly beyond an upper edge of said longitudinal rail.

19. Linear air diffuser apparatus comprising:

two longitudinal rails maintained in laterally spaced parallel condition by at least two transverse connector members each connected at its opposite ends to a respective one of said parallel rails; and

at least two adjustable air flow control members extending longitudinally between said connector members, each flow control member having a planar blade end portion at each longitudinally outer end,

wherein each connector member comprises an upper block and a lower block with said blade end portions received between said upper and lower blocks and at least one of said blocks provided on a side facing said end portions with a resiliently compressible engagement member compressed between the blocks and exerting a resilient reaction urging and gripping said end portions against the other of said blocks.

20. Apparatus as claimed in claim 19 wherein said engagement member extends continuously substantially the entire length of the distance between the rails.

21. Apparatus as claimed in claim 19 wherein each engagement member is captured in a transversely extending recess in said at least one block.

22. Apparatus as claimed in claim 21 wherein the recess is C shaped and the engagement member has on one side a pair of longitudinally outwardly directed ears received in said C shaped recess.

23. Apparatus as claimed in claim 19 wherein each rail has on an inner face a downwardly open channel recess at an upper region and an upwardly open channel recess at a lower region and each block having an upstanding portion adjacent each end, and a resilient reaction exerted by said engagement member lodges each said upstanding portion in a respective adjacent channel recess.

24. Apparatus as claimed in claim 23 wherein each said upstanding portion is defined between a longitudinally extending groove formed in a vertically outer face of the block and an adjacent end surface of the block.

25. Apparatus as claimed in claim 19 wherein each block comprises a length severed from an extrusion.

26. Apparatus as claimed in claim 19 wherein an upper side of each upper block is formed with a pair of transversely extending channels.

27. Apparatus as claimed in claim 26 wherein a side of each transversely extending channel is provided with a re-entrant lip flange that retains a hook-in hanger member.

28. Apparatus as claimed in claim 27 wherein said re-entrant lip flange is on a longitudinally outer side of each channel and said hanger member comprises a pair of hanger elements each having an upper portion offset from an intermediate portion, a laterally extending recess and a transition portion between said upper and intermediate portions, each upper portion having an opening therethrough, and said elements sliding from a spaced condition to an aligned condition wherein the openings are in register and the upper portion of each element is disposed on a side of the other element opposite a side that said intermediate portion is disposed on, with a transition portion of each element received in the recess of the other element.

29. Apparatus as claimed in claim 19 comprising a separate inverted T-section piece connected to a lower end of each said longitudinal rail.

30. Apparatus as claimed in claim 29 wherein each T-section piece comprises an upright clinch-locked to each said longitudinal rail.

31. A linear air diffuser as claimed in claim 29, wherein each said longitudinal rail is finished black and each T-section piece is finished a lighter color.

32. Apparatus as claimed in claim 19 wherein each said longitudinal rail has on an outer side a C-shaped recess receiving at least one connection plate.

33. Apparatus as claimed in claim 32 wherein said connection plate includes a portion extending laterally outwardly and upwardly beyond an upper edge of said longitudinal rail.

34. Apparatus as claimed in claim 19 wherein each connector member has a uniform cross-section.

35. Apparatus as claimed in claim 19 wherein one of the upper and lower blocks includes a tongue and the other of the upper and lower blocks includes a recess such that the tongue of the one block is received in the recess of the other block.

36. Apparatus as claimed in claim 19 wherein each of the upper and lower blocks includes a tongue and a transversely extending recess such that the tongue of each block is received in the recess of the other block.

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