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(54) **Paper cutting apparatus**

Papierschneidvorrichtung

Dispositif de coupe de papier

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Description

[0001] The present invention relates to an apparatus for cutting paper or similar sheets of material and a method of producing such an apparatus.

[0002] Paper cutting apparatus are well know for example guillotines and paper slicers with rotatable blades which cut along a fixed edge. For example please see GB-A-2 085 792, US-A-5243890 and EP-A-0 234 016.

[0003] It is appreciated, *inter alia* from the above referenced documents, that the blades must be accurately and stably positioned in relation to one another for precise cutting. Furthermore all the apparatus are provided with a planar paper support to allow safe feeding of the paper to the blades and accurate positioning of the paper at the blades. However, this has led to the paper cutting apparatus of prior art being bulky and cumbersome objects.

[0004] The present invention seeks to provide another paper cutting apparatus.

[0005] According to a first aspect of the present invention there is provided a cutting apparatus for cutting paper, comprising cutting means having a cutting line along which blade means are arranged to cut, and further including a support surface extending from the cutting means to a distal edge, wherein the support surface is pivotably mounted so that the distal edge is pivotable towards the cutting means. This allows for a particularly compact design of cutting apparatus whilst maintaining the required structural rigidity and paper guides.

[0006] Preferably, the blade means is manually movable. Advantageously, the blade means includes a rotatable blade, the cutting edge of which is movable along the cutting line. This allows a particularly simple and compact apparatus.

[0007] The rotatable blade may be movable along a support beam and in which case the support beam may be connected to a back member which back member is a structural member of the a cutting apparatus. The cutting line will normally comprise the edge of a fixed blade on a base member. The base member is advantageously a structural member of the a cutting apparatus and the support surface comprises a front member which is also advantageously a structural member. The structural members comprise a housing which essentially enclose the cutting means when the distal edge of the support surface has been pivoted towards the cutting means.

[0008] In a preferred embodiment the, some or each of the structural components comprises an extruded component. The extruded component may be an extruded aluminium component.

[0009] The, some or each structural component of the cutting apparatus is advantageously shaped to resist a bending moment along the cutting line. For example the components may be curved to resist bending in a particular direction.

[0010] The support surface preferably includes guide

means for guiding the paper to the cutting means.

[0011] According to a second aspect of the present invention there is provided a method of producing a cutting apparatus including the steps of providing:

a cutting means with a cutting line;
blade means arranged to cut along the cutting line;
a support surface extending from the cutting means to a distal edge and including pivot means so that the distal edge is pivotable towards the cutting means.

[0012] Preferably, the cutting apparatus includes structural members where the, some or each structural member is an extruded member, such as an extruded aluminium member. This allows particular savings in production cost especially when cutting apparatus sized for different sizes of paper are required as different tooling for the different sizes of apparatus is reduced.

[0013] A preferred embodiment of the invention will now be described with reference to the accompanying drawings in which:

Fig. 1 is a top perspective view of a preferred embodiment of the cutting apparatus of the present invention in a cutting position;

Fig. 2 shows the view of Fig. 1 with the apparatus in a closed position;

Fig. 3 is a exploded view of the apparatus of Figs. 1 and 2 illustrating the component parts.

[0014] As shown in the all Figures and especially in Fig. 3, the cutting apparatus of the present invention is formed from a number of component parts. These may be assembled in to the apparatus of Figs. 1 and 2.

[0015] The apparatus has structural components which form a housing about the cutting components. The main structural components are base member 5, the front member 4 and back member 3. These three member 3, 4 and 5 are connected together by means of a pair of opposed side plates 39, 40. Each end plate 39, 40 is attached to each structural components by screws 23.

[0016] A fixed cutting blade 12 is formed from mild steel and fixed to base member 5 by screws 21 underneath pressure rail 35. Two runners 47 form support feet for the apparatus and are inserted into channels in base member 5.

[0017] A cutter housing 32 houses a rotary cutter 13 made from stainless steel. The rotary cutter is fitted into the cutter housing 32 on a shaft 14. A splined cutter locator 37 holds one side the rotary cutter in position against a pressure wheel 45. The other side of the rotary cutter 13 is held in position by a spring 16 acting through washer 19 against a pressure plate 36 which abuts the rotary cutter 36.

[0018] The cutter housing 32 is slidably mounted in a channel on back member 3. The cutter housing is manually movable in the channel. The rotary cutter 13 rotates as the housing is slid along the channel. The interface between the rotary cutter 13 and the fixed cutter 12 defines a cutting line.

[0019] The front member 4 is mounted on to the side covers 39, 40 via a pair of pair guides 29, 30. The front member is mounted to be movable between a first position ('cutting' as shown in Fig. 1) and a second position ('closed' as shown in Fig. 2) by rotation about an axis substantially parallel to the cutting line. Extrusions 42 on each paper guide 29, 30 fit in to corresponding recesses 41 in the respective side members 39, 40. The recesses 41 are shaped as a blind channel to allow the extrusion 42 to be moved between the two positions. The paper guide 39 includes a high level paper guide 43. Whereas the paper guide 30 includes a low level paper guide 44.

[0020] The pivotable nature of the front member 4 allows for the apparatus to be a particular compact design as it eliminates the large paper support surface when the apparatus is not in use. The physical dimensions of the apparatus are relatively small compared to previously known cutters having equivalent blade length. Preferably the cutting apparatus is made to be portable, i.e. transportable in a briefcase.

[0021] In part the relatively small size is attributable to the structural members 3, 4, 5 and the side panels 39, 40 being curved to resist a bending moment on the cutter housing support towards the fixed cutter 12. The generally triangular cross-sectional shape of the housing also provides additional strength to the apparatus.

[0022] In a preferred method of manufacturing the apparatus the structural member(s) 3, 4, 5 are extruded, preferably from aluminium or other suitable material such as a plastics material of suitable torsional strength. This allows for the blade length to be altered without requiring different plant and tooling for different blade lengths.

[0023] It will be appreciated that throughout out specification, references to paper or the cutting thereof refers to any sheet material, such as plastics sheet used with overhead projectors.

[0024] Figure 3 shows an exploded view of the apparatus according to a preferred embodiment of the invention. Figure 3 shows the following components: spring (16); washer (19); pressure plate (36); rotary cutter (13); shaft (14); cutter locator (37); pressure wheel (45); cutter housing (32); fixed cutter (12); base extrusion (5); left side end cap (39); first screws (23); left side paper guide (29); back extrusion (3); pressure rail (35); second screws (21); right side end cap (40); right side paper guide (30); front extrusion (4), and 2 x feet (47).

[0025] The present invention relates to an apparatus for cutting paper or similar sheets of material and a method of producing such an apparatus. The cutting apparatus includes a cutting means having a cutting line

along which blade means are arranged to cut. A support surface extends from the cutting means to a distal edge and the support surface is pivotably mounted so that the distal edge is pivotable towards the cutting means.

Claims

1. A cutting apparatus for cutting paper, comprising cutting means (12) having a cutting line along which blade means (13) are arranged to cut, and further including a support surface (4) arranged to support paper to be cut extending from the cutting means (12) to a distal edge, **characterised in that** the support surface (4) is pivotably mounted so that the distal edge is pivotable about an axis substantially parallel to the cutting line towards the cutting means (12).
2. The cutting apparatus according to claim 1, wherein (a) the blade means (13) is manually movable, and/or (b) the blade means (13) includes a rotatable blade, the cutting edge of which is movable along the cutting line.
3. The cutting apparatus according to claim 2, wherein the rotatable blade is movable along a support beam (14), and optionally wherein the support beam (14) is connected to a back member (3) which back member (3) is a structural member of the cutting apparatus.
4. The cutting apparatus according to any one of claims 1 to 3, wherein (a) the cutting line comprises the edge of a fixed blade (12) on a base member (5), which base member (5) is a structural member of the cutting apparatus and/or (b) the support surface (4) comprises a front member which is a structural member.
5. The cutting apparatus according to claim 3 or claim 4, wherein (a) the structural members (3,4,5) comprise a housing which essentially enclose the cutting means (12) when the distal edge of the support surface (4) has been pivoted towards the cutting means (12), and/or (b) the, some or each of the structural members (3,4,5) comprises an extruded component, and optionally wherein the extruded component is an extruded aluminium component, and/or (c) the, some or each structural member is shaped to resist a bending moment along the cutting line.
6. The cutting apparatus according to any one of claims 1 to 5, wherein the support surface (4) includes guide means (29,30) for guiding the paper to the cutting means (12).

7. A method of producing cutting apparatus including the steps of

(a) providing a number of component parts, namely a cutting means (12) with cutting line, a blade means (13), a support surface (4) and pivot means; and

(b) assembling the component parts such that the blade means (12) is arranged to cut along the cutting line, the support surface is arranged to support paper to be cut along the cutting line, the support surface extends from the means to a distal edge and the pivot means is arranged so that the distal edge of the support surface (4) is pivotable about an axis substantially parallel to the cutting line towards the cutting means (12).

8. The method according to claim 7, wherein the cutting apparatus includes structural members (3,4,5), where the, some or each structural member is an extruded member, e.g. an aluminium extrusion.

9. The method according to either claim 7 or claim 8, wherein the cutting apparatus comprises the cutting apparatus according to any one of claims 1 to 6.

Patentansprüche

1. Schneidvorrichtung zum Schneiden von Papier, die eine Schneideinrichtung (12) mit einer Schnittlinie umfaßt, entlang welcher eine Klingeneinrichtung (13) zum Schneiden angeordnet ist, und die ferner eine Auflagefläche (4) umfaßt, die so angeordnet ist, daß sie zu schneidendes Papier unterstützt, und sich aus der Schneideinrichtung (12) zu einem entfernten Ende erstreckt, **dadurch gekennzeichnet, daß** die Auflagefläche (4) schwenkbar angebracht ist, so daß das entfernte Ende um eine im wesentlichen zur Schnittlinie parallele Achse zur Schneideinrichtung (12) hin schwenkbar ist.

2. Schneidvorrichtung nach Anspruch 1, bei der (a) die Klingeneinrichtung (13) von Hand bewegbar ist und/oder (b) die Klingeneinrichtung (13) eine drehbare Klinge umfaßt, deren Schneidkante entlang der Schnittlinie bewegbar ist.

3. Schneidvorrichtung nach Anspruch 2, bei der die drehbare Klinge entlang eines Trägerstabes (14) bewegbar ist und bei der wahlfrei der Trägerstab (14) mit einem Rückseitenelement (3) verbunden ist, welches Rückseitenelement (3) ein Bauteil der Schneidvorrichtung ist.

4. Schneidvorrichtung nach einem der Ansprüche 1 bis 3, bei der (a) die Schnittlinie die Kante einer fe-

sten Klinge (12) auf einem Basiselement (5) umfaßt, welches Basiselement (5) ein Bauteil der Schneidvorrichtung ist, und/oder (b) die Auflagefläche (4) ein Vorderseitenelement umfaßt, das ein Bauteil ist.

5. Schneidvorrichtung nach Anspruch 3 oder Anspruch 4, bei der (a) die Bauteile (3, 4, 5) ein Gehäuse umfassen, das die Schneideinrichtung (12) im wesentlichen umschließt, wenn das entfernte Ende der Auflagefläche (4) zur Schneideinrichtung (12) hin geschwenkt wurde, und/oder (b) die, einige oder jedes der Bauteile (3, 4, 5) einen extrudierten Bestandteil umfaßt und wobei wahlfrei der extrudierte Bestandteil ein extrudierter Aluminiumbestandteil ist, und/oder (c) die, einige oder jedes der Bauteile so geformt ist, daß es einem Biegemoment entlang der Schnittlinie widersteht.

6. Schneidvorrichtung nach einem der Ansprüche 1 bis 5, bei der die Auflagefläche (4) Führungsmittel (29, 30) zum Führen des Papiers zur Schneideinrichtung (12) umfaßt.

7. Verfahren zur Herstellung einer Schneidvorrichtung, das die Schritte umfaßt:

(a) Bereitstellen einer Anzahl von Bestandteilen, nämlich einer Schneideinrichtung (12) mit einer Schnittlinie, einer Klingeneinrichtung (13), einer Auflagefläche (4) und einer Schwenkeinrichtung; und

(b) Zusammensetzen der Bestandteile, so daß die Klingeneinrichtung (12) so angeordnet wird, daß sie entlang der Schnittlinie schneidet, die Auflagefläche so angeordnet wird, daß sie zu schneidendes Papier entlang der Schnittlinie unterstützt, die Auflagefläche sich von der Einrichtung zur einem entfernten Ende erstreckt und die Schwenkeinrichtung so angeordnet wird, daß das entfernte Ende der Auflagefläche (4) um eine im wesentlichen zur Schnittlinie parallele Achse zur Schneideinrichtung (12) hin schwenkbar ist.

8. Verfahren nach Anspruch 7, bei dem die Schneidvorrichtung Bauteile (3, 4, 5) umfaßt, bei denen die, einige oder jedes Bauteil ein extrudiertes Element ist, z.B. ein Aluminiumextrudat.

9. Verfahren nach Anspruch 7 oder Anspruch 8; bei dem die Schneidvorrichtung die Schneidvorrichtung nach einem der Ansprüche 1 bis 6 umfaßt.

Revendications

1. Dispositif de coupe destiné à couper du papier,

- comprenant des moyens de coupe (12) dotés d'une ligne de coupe le long de laquelle des moyens formant lame (13) sont disposés pour couper, et comprenant en outre une surface de support (4) disposée pour soutenir du papier à couper s'étendant à partir des moyens de coupe (12) jusqu'à une arête distale, **caractérisé en ce que** la surface de support (4) est montée de façon à pivoter de sorte que l'arête distale peut pivoter autour d'un axe sensiblement parallèle à la ligne de coupe vers les moyens de coupe (12).
2. Dispositif de coupe selon la revendication 1, dans lequel (a) les moyens formant lame (13) sont mobiles manuellement, et/ou (b) les moyens formant lame (13) comprennent une lame pouvant effectuer une rotation, dont l'arête de coupe est mobile le long de la ligne de coupe.
 3. Dispositif de coupe selon la revendication 2, dans lequel la lame pouvant effectuer une rotation est mobile le long d'une poutre de support (14), et dans lequel la poutre de support (14) est facultativement reliée à un élément arrière (3) lequel élément arrière (3) est un élément structurel du dispositif de coupe.
 4. Dispositif de coupe selon l'une quelconque des revendications 1 à 3, dans lequel (a) la ligne de coupe comprend l'arête d'une lame fixe (12) sur un élément de base (5), lequel élément de base (5) est un élément structurel du dispositif de coupe et/ou (b) la surface de support (4) comprend un élément frontal qui est un élément structurel.
 5. Dispositif de coupe selon la revendication 3 ou la revendication 4, dans lequel (a) les éléments structurels (3, 4, 5) comprennent un logement qui renferme structurellement les moyens de coupe (12) lorsque l'on a fait pivoter l'arête distale de la surface de support (4) vers les moyens de coupe (12), et/ou (b) les, certains ou chacun des éléments structurels (3, 4, 5) comprennent un composant extrudé, et dans lequel le composant extrudé est optionnellement un composant en aluminium extrudé, et/ou (c) l'on donne une forme au, à un certain ou à chaque élément structurel pour résister à un couple de flexion le long de la ligne de coupe.
 6. Dispositif de coupe selon l'une quelconque des revendications 1 à 5, dans lequel la surface de support (4) comprend des moyens de guidage (29, 30) destinés à guider le papier jusqu'aux moyens de coupe (12).
 7. Procédé de production de dispositif de coupe comprenant les étapes consistant à :
 - (a) fournir un nombre de pièces constitutives, à savoir des moyens de coupe (12) avec ligne de coupe, des moyens formant lame (13), une surface de support (4) et des moyens à pivot ; et
 - (b) assembler les pièces constitutives de telle sorte que les moyens formant lame (12) soient disposés le long de la ligne de coupe, la surface de support étant disposée pour soutenir du papier à couper le long de la ligne de coupe, la surface de support s'étendant des moyens jusqu'à une arête distale et les moyens formant pivot étant disposés de telle sorte que l'arête distale de la surface de support (4) puisse pivoter autour d'un axe sensiblement parallèle à la ligne de coupe vers les moyens de coupe (12).
 8. Procédé selon la revendication 7, dans lequel le dispositif de coupe comprend des éléments structurels (3, 4, 5), où le, un certain ou chaque élément structurel est un élément extrudé, par exemple une extrusion d'aluminium.
 9. Procédé selon la revendication 7 ou la revendication 8, dans lequel le dispositif de coupe comprend le dispositif de coupe selon l'une quelconque des revendications 1 à 6.

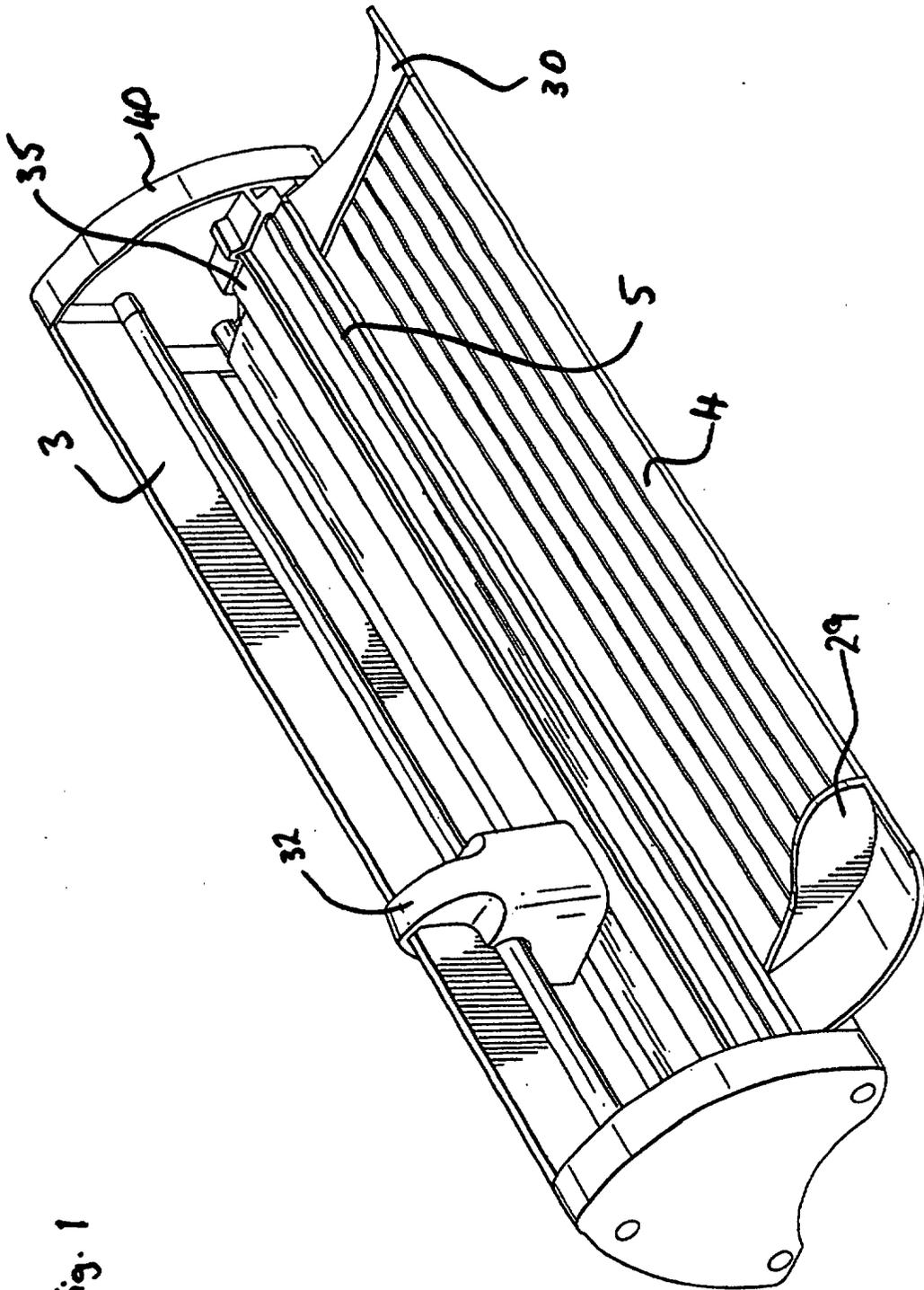


Fig. 1

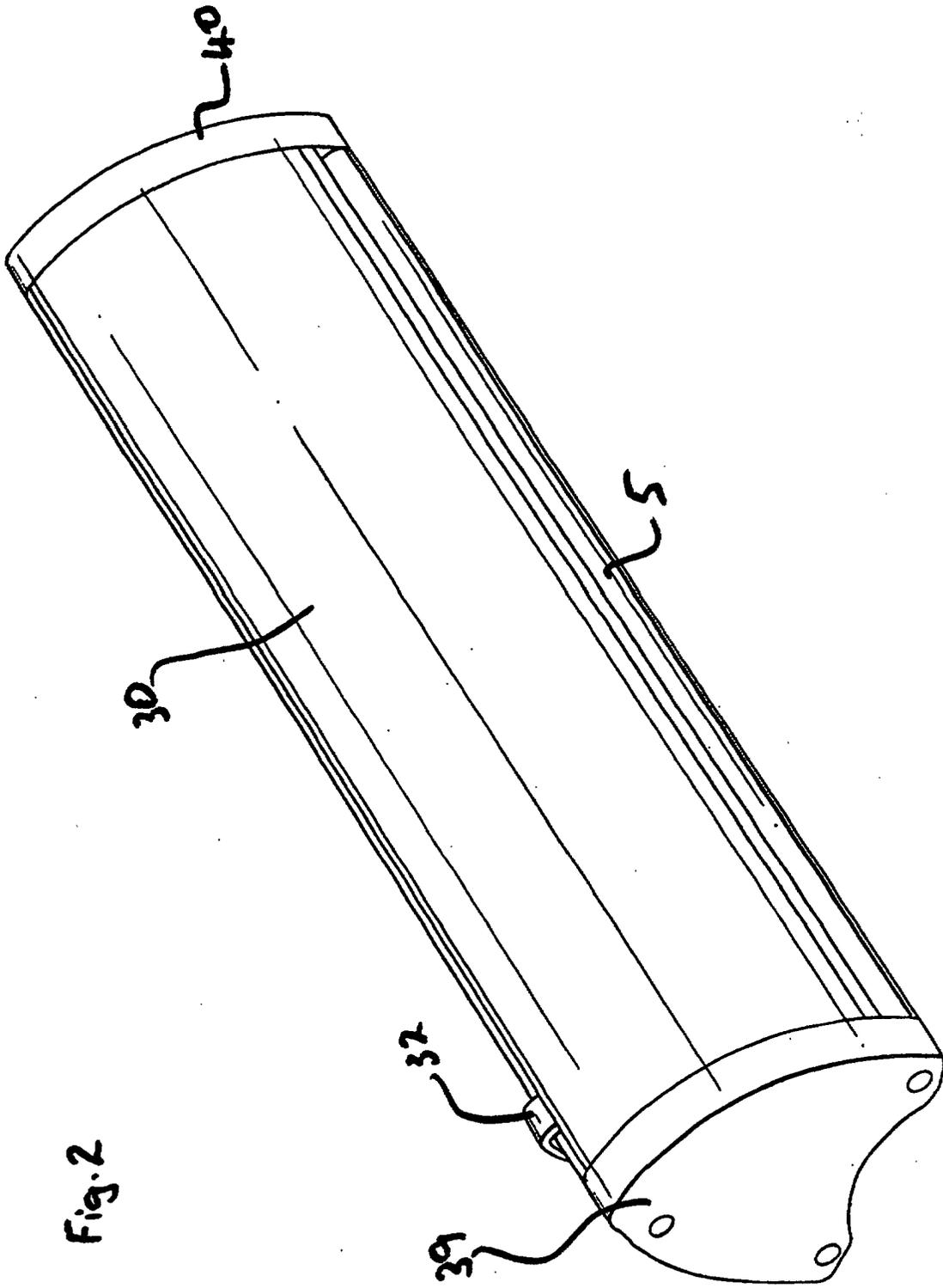


Fig. 2

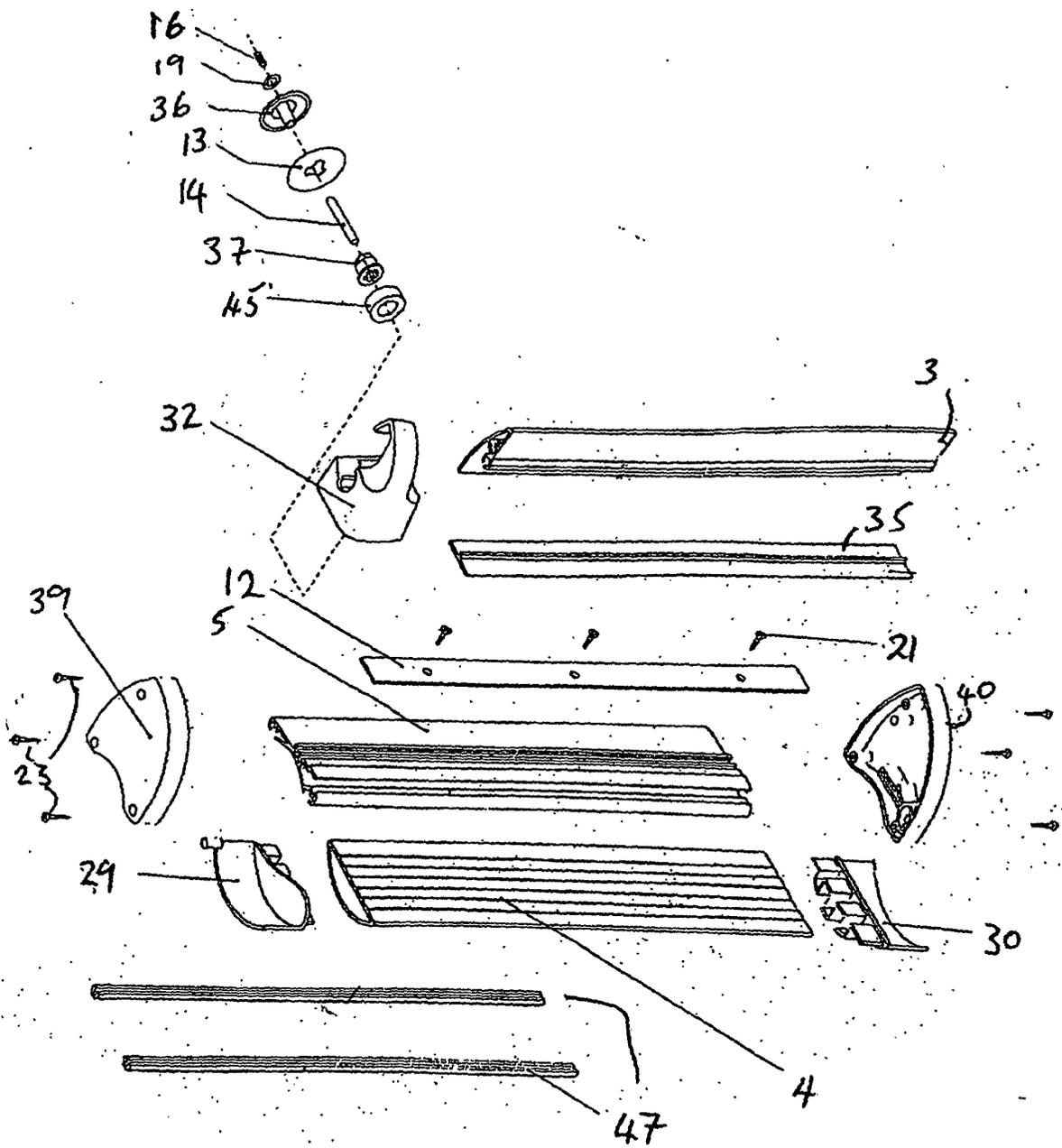


Fig. 3