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(56) Documents Cited

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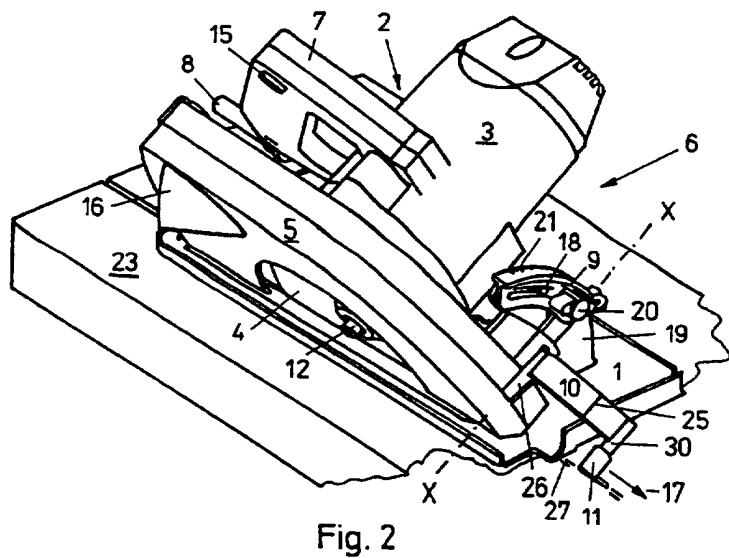
(58) Field of Search

UK CL (Edition P) **B5L**
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(54) Abstract Title

Circular hand saw with a cutting line indicator

(57) A circular hand saw has a cutting line indicator 11 lying in a plane (Fig. 1, E1-E1) defined by the saw blade 4 and is mounted on an arm 10 projecting in the cutting direction 17 of the saw. The arm 10 is mounted on an assembly group comprising a motor 3, saw blade 4 and protective cover 5 and is swivelable in a plane (Fig. 1, E2-E2) lying parallel to that defined by the saw blade 4. The assembly group 3-5 is pivotally connected to the saw's base plate 1 for making mitre cuts. The arm 10 may have a projection 30 directed at right angles to its swivelling plane and to which the cutting line indicator 11 is adjustably fastened, it may also have an offset or curvature 25 directed towards the cutting line 27. The cutting line indicator 11 may comprise a sliding foot (Fig. 4, 39), a disc headed screw or a disc rotatably mounted on a screw (Fig. 4, 37 and 38). A spring (Fig. 4, 40) can be employed to press the arm 10 towards a workpiece 23.



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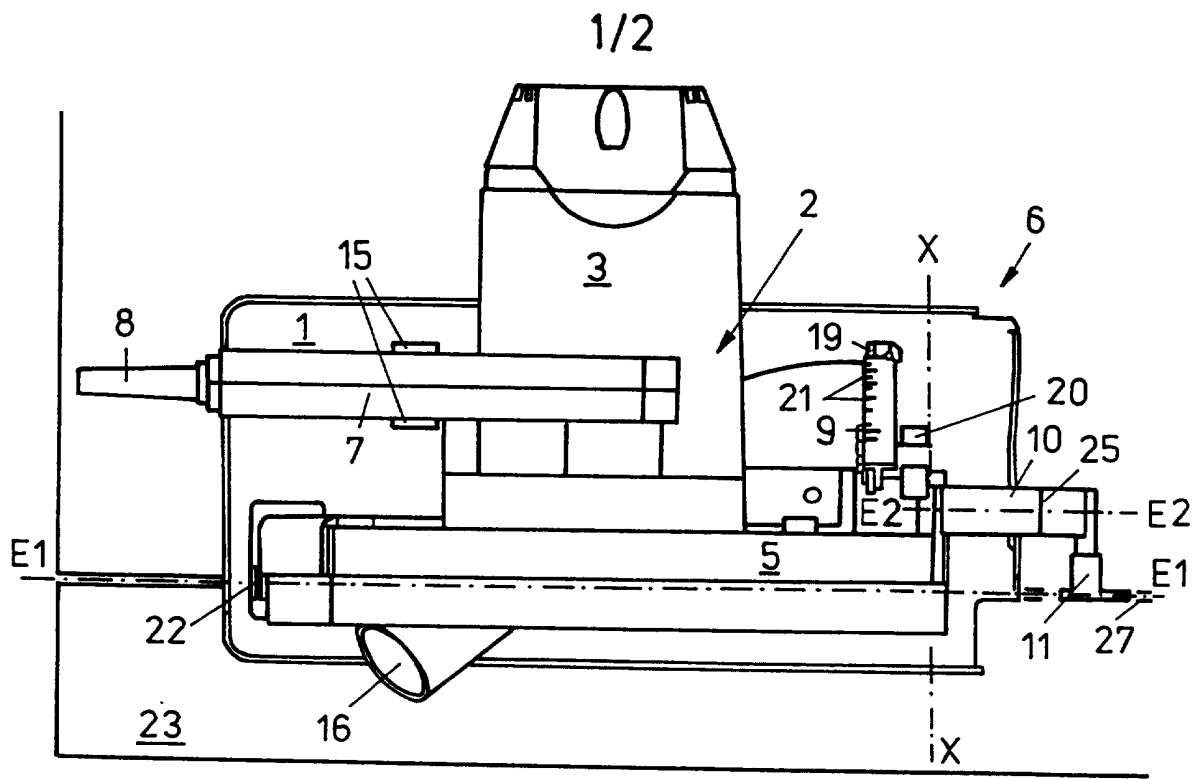


Fig. 1

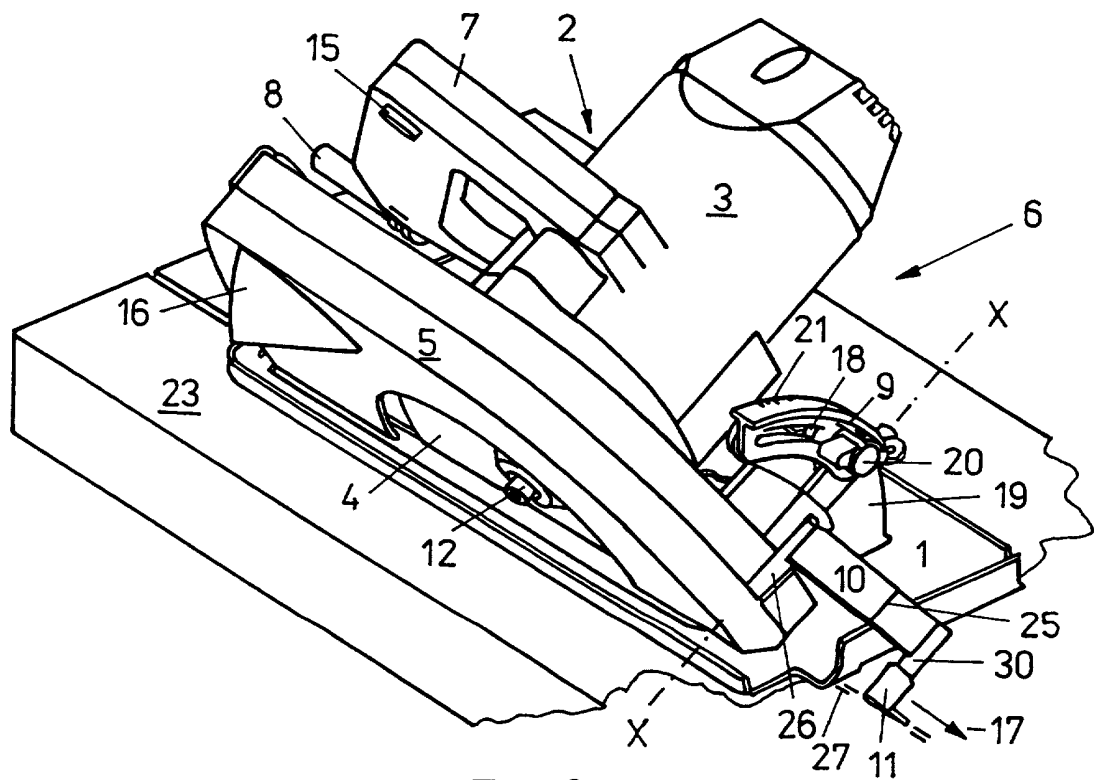


Fig. 2

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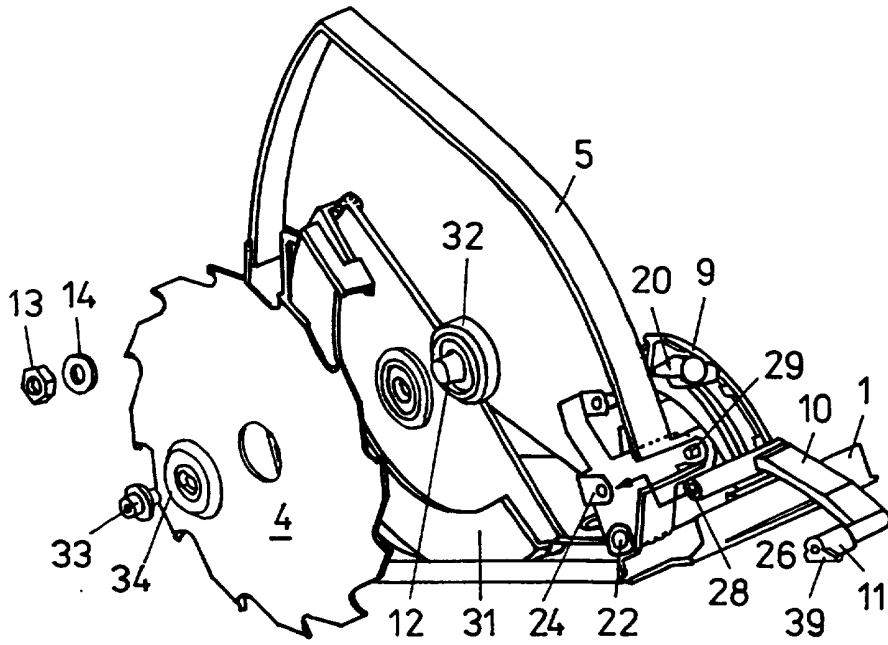


Fig. 3

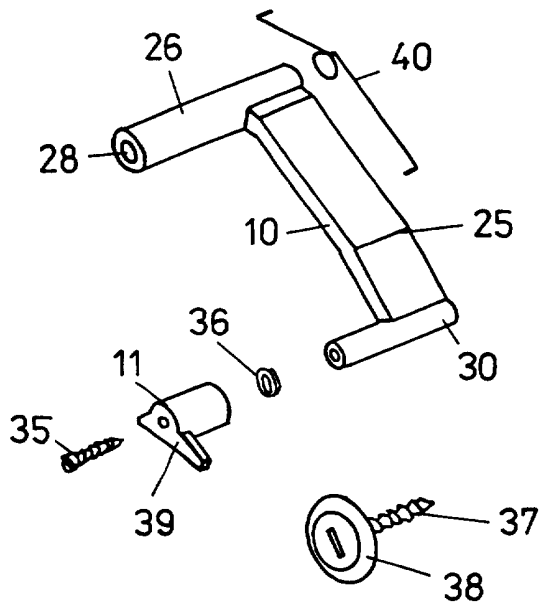


Fig. 4

Circular hand saw with a cutting line indicator

The invention proceeds from a circular hand saw with a cutting line indicator according to the preamble of claim 1.

DE 28 00 378 C2 discloses a circular hand saw with a guidance aid comprising a rule, which is adjustable parallel and at right angles to the saw blade. Said guidance aid, besides being an expensive, laterally projecting and hence vulnerable device which may easily be deformed and maladjusted under the harsh conditions of practical use, is also laborious to operate. Each time it is used, the guidance aid namely has first to be aligned in a first position parallel to the circular saw blade before being moved into a second position along a scribe line. Furthermore, with angular cuts, parallaxes arise; the arrangement of the guidance aid has to be readapted and set to the respective inclination of the saw blade relative to a base plate, because the guidance aid is fastened to the base plate and does not follow the inclinations of the saw blade.

Compared to prior art, the circular hand saw according to the invention having the characterizing features of claim 1 has the advantage that a compact, rugged and - in every position of the saw blade - clear and precise cutting line indicator is thereby provided.

The mounting of the cutting line indicator on the circular hand saw with the aid of a swivel arm, which is aligned during use of the circular hand saw in the direction of the latter's forward feed motion and is capable of swivelling about an axis parallel to the motor shaft, avoids lateral projections and guides on the circular hand saw. The swivel arm extends in front of the circular hand saw in the direction of the cutting line with a length which is as short as possible.

Since the cutting line indicator following the swivelling motion of the saw blade is always supported on the surface of the workpiece, its position relative to the saw blade remains constant so that parallaxes relative to the saw blade and hence incorrect indications of the saw blade position are ruled out. In

other words, as a result of the arrangement of the bearing points of the arm the cutting line indicator, upon setting of a mitre angle, always sets itself into the same inclined position as the saw blade without departing from the plane defined by the saw blade.

To guarantee the advantage of a permanently clear view of the scribed cutting line, the arm is disposed offset parallel to the plane defined by the saw blade and is provided at one end with an attachment, which is directed at right angles to the swivelling plane of the arm and to the plane defined by the saw blade and to which the cutting line indicator is fastened adjustably by means of a screw, which is counteracted by a pressure spring in order to avoid tolerance influences.

It is moreover advantageous when the cutting line indicator has a sliding foot, which may be placed securely onto the workpiece and is capable of swivelling, or when the cutting line indicator is formed by a disc mounted rotatably on the adjustable fastening screw.

It is however also possible to use, as a cutting line indicator, a screw which has a disc-shaped head. The previously described screws are screwed into the end face of the attachment directed towards the saw blade. The thicknesses of foot, disc and saw blade are preferably identical. An adequate flexural strength of the arm at right angles to its swivelling plane is achieved through its design as a flat piece. The arm, in order to go around appliance edges, is moreover provided towards the attachment end with at least one bend (offset) or curvature, which is directed towards the cutting line. So that the cutting line indicator participates in all of the swivelling motions of the assembly group, including the saw blade, about a swivelling axis directed parallel to the plane defined by the saw blade and to the base plate, the arm is pivotally mounted on the assembly group comprising motor, saw blade and protective hood by means of an axle piece, which is fastened to the other end of the arm.

The axle piece is advantageously mounted in an articulated fork, which is the main connecting piece between the protective cover and a base plate.

So that during use of the circular hand saw according to the invention the cutting line indicator is always in contact with the cutting line or the workpiece, a spring, preferably a torsion spring, is provided which is supported on the one hand against the assembly group and on the other hand against the arm and presses said arm onto the workpiece.

There follows a detailed description of embodiments of the invention which are diagrammatically illustrated in the drawings. The drawings show:

- Fig. 1 a plan view of a circular hand saw according to the invention,
- Fig. 2 a perspective view of the circular hand saw according to the invention with a swivelled assembly group,
- Fig. 3 an exploded view of the basic parts of a circular hand saw according to the invention and
- Fig. 4 an exploded view of the cutting line indicator with associated arm.

In Figures 1 and 2, an assembly group 2 comprising a motor 3, a saw blade 4 and a protective cover 5 of a circular hand saw 6 is disposed as a unit on a base plate 1. The assembly group 2 further comprises a handle 7 with an electric service cable 8, a curved link guide 9 and a swivel arm 10, which carries a cutting line indicator 11, is carried by the protective cover 5 and jointly with the latter is capable of swivelling about an axis X - X.

The motor 3 has a shaft 12 (Fig. 3), which is parallel to the axis X - X and on the free end of which the saw blade 4 is fastened with the aid of a screw nut 13. The handle 7 provided with an electric switch 15 is fastened to the housing of the motor 3 and used to hold and guide the circular hand saw 6, preferably for single-handed operation. The handle 7 is disposed substantially parallel to the protective cover 5, which almost fully encloses the saw blade 4 above the base plate 1, and parallel to a plane E1 - E1, defined by the saw blade 4, at right angles to the axis X - X (Fig. 1). The protective cover 5 is provided at

its side remote from the motor 3 with an ejection connection piece 16 for sawdust. The protective cover is further mounted on the assembly group 2 so as to be capable of swivelling about an axis, which extends substantially parallel to the driving shaft 12 and is situated in the vicinity of the - viewed in cutting direction 17 - front part of the base plate 1, in such a way that the saw blade 4 may in an unimpeded manner be removed from or fastened to the shaft 12.

The curved link guide 9 embraces a screw bolt 18, which is screwed into a bracket 19 fastened to the base plate 1 and carries a wing handle 20. By turning the wing handle 20, the link guide 9 and hence the assembly group 2 are lockable in selectable angular positions relative to the bracket 19 and the base plate 1. The angular position is readable from a degree scale 21 provided in a clearly visible manner on the link guide 9. With the link guide 9 the entire assembly group 2 is capable of swivelling in bearings 22 relative to the base plate 1 and so selectable mitre-cutting positions of the saw blade 4 are adjustable relative to a workpiece 23, onto which the base plate 1 of the circular saw 6 is placed.

On an articulated fork 24 (Fig. 3) connecting the protective cover 5 to the base plate 1 and participating in all of the swivelling motions of the assembly group 2, the swivel arm 10, which is provided with at least one offset 25 and with an axle piece 26 at one end, is mounted in a plane $E_2 - E_2$ so as to be capable of swivelling about the axis $X - X$ parallel to the driving shaft 12, the planes $E_1 - E_1$ and $E_2 - E_2$ being at least approximately parallel and being situated at a distance from one another which allows a worker situated behind the circular hand saw 6 and operating the circular hand saw to guide the cutting line indicator 11 along a scribe or cutting line 27 in an unimpeded manner. The swivel arm 10 projects in forward feed or cutting direction 17 from the base plate 1. The axle piece 26 projects beyond the width of the swivel arm 10 at one side, namely in the direction of the saw blade 4, and is provided at both ends with bearing bushes 28 (Fig. 3), into which corresponding journals 29 of the articulated fork 24 project.

Disposed at the other offset end of the swivel arm 10 is an attachment 30, which like the axle piece 26 juts out at one side and on which the cutting line indicator 11 is pivotally so disposed that it is situated in the plane E1 - E1 and always lies flat on the workpiece 23.

The thickness of the cutting line indicator 11 is preferably identical to the thickness of the saw blade 4 so that, at least for square cuts (cuts without mitring), the cutting width is indicated exactly by the cutting line indicator 11. Since the cutting line indicator 11 participates in all of the setting motions of the assembly group 2, is always situated in the plane E1 - E1 defined by the saw blade 4 and, as a result of its mounting, is in permanent contact with the workpiece 23 when the circular hand saw 6 is placed thereon, its cutting line indication is exact not only for mitre angles 0° and 45° but also for all angles in between.

In the exploded view of Fig. 3, the exploded assembly group 2, which substantially comprises the saw blade 4, the protective cover 5, a stub of the motor shaft 12, a pendulum guard 31, a socket-head cap screw 33 with intermediate piece 34 or a screw nut 13 with washer 14, the articulated fork 24, the arm 25 and the link guide 9, is mounted on the base plate 1 in bearings 22 so as to be capable of swivelling about an axis, which is disposed in the plane E1 - E1 parallel to the base plate 1. The pendulum guard 31 is provided on a bearing piece 32 so as to be capable of swivelling about the motor shaft 12 in such a way that, upon forward feed of the circular hand saw 6, it exposes the part of the saw blade 4 situated below the base plate 1. The protective cover 5 open at one side is mounted on the articulated fork 24 so as to be capable of swivelling about an axis (not shown) directed parallel to the swivelling axis X - X of the swivel arm 10, which is rotatable by means of the axle piece 26 between the journals 29. Instead of the socket-head cap screw 33, the screw nut 13 with washer 14 may be used.

The cutting line indicator 11 is disposed on the attachment 30 so as to be capable of swivelling about an axis parallel to the swivelling axis of the swivel arm 10. The cutting line indicator 11 may alternatively be mounted on the attachment 30 so as to be capable of swivelling in all directions.

The exploded view of Fig. 4 shows the swivel arm 10 manufactured from a flat piece of material, which has at its bearing end the axle piece 30 and at its opposite free end the attachment 30, both of said parts projecting laterally in the same direction from the swivel arm 10. The cutting line indicator 11 is fastened by means of a screw 35, which defines its rotary or swivelling axis, rotatably and counter to the action of a pressure spring 36 to the end face of the free end of the attachment 30. The cutting line indicator 11 is placed with its oblong foot 39 onto the cutting line 27 (Figures 1 and 2). The cutting line indicator 11 may however alternatively take the form of a disc 38 which is rotatable about the screw 35 or the enlarged head of a screw 37, the latter also being screwed counter to the action of the pressure spring 36, without a foot, into the end face of the attachment 30. In each case, by turning the screw 35 or 37 the cutting line indicator 11 is laterally adjustable and hence settable into the plane E1 - E1. The thickness of the foot 39 or of the disc 38 may moreover be identical to the thickness of the saw blade 4.

A torsion spring 40 is supported on the one hand against the articulated fork 24 (Fig. 3) and on the other hand against the swivel arm 10 and thereby effects permanent contact of the cutting line indicator 11 with the workpiece 23 when the circular hand saw 6 is placed onto a workpiece.

When in use, the cutting line indicator 11 is set up and aligned with the saw blade 4 and then, with guidance of the cutting line indicator 11 along the cutting line 27, the circular hand saw 6 according to the invention is moved forward in a cutting manner. When not in use, the swivel arm 10 with the cutting line indicator 11 is hingeable about the axis X - X in such a way that it comes to

rest against the protective cover 5 and neither increases the size of the circular hand saw 6 nor itself adopts a prominent, obstructive and vulnerable position.

CLAIMS

1. Hand machine tool with a disc-shaped tool, in particular a circular hand saw (6) having a cutting line indicator (11) and having an assembly group (2), which comprises a motor (3), a saw blade (4) and a protective cover (5) and is pivotally connected to a base plate (1), the cutting line indicator (11) being situated in a plane (E1 - E1) which is defined by the saw blade (4), characterized in that the assembly group (2) carries an arm (10), which projects in forward feed direction from the base plate (1) and at its free end carries the cutting line indicator (11), and that the arm (10) is mounted on the assembly group (2) so as to be capable of swivelling in a plane (E2 - E2) parallel to the saw blade (4).
2. Hand machine tool according to claim 1, characterized in that the arm (10) at its one end has, directed at right angles to its swivelling plane (E2 - E2) and projecting laterally relative to the saw blade (4), an attachment (30) to which the cutting line indicator (11) is fastened.
3. Hand machine tool according to claim 2, characterized in that the cutting line indicator (11) is screw-fastenable to the end face of the attachment (30) and adjustable counter to the action of a pressure spring (36).
4. Hand machine tool according to claim 3, characterized in that the cutting line indicator (11) is provided with a sliding foot (39).
5. Hand machine tool according to claim 3, characterized in that the cutting line indicator (11) is a screw (37), the head of which is fashioned as a disc (38).

6. Hand machine tool according to claim 3, characterized in that the cutting line indicator (11) takes the form of a disc rotatably mounted on a screw (35).
7. Hand machine tool according to claim 2, characterized in that the arm (10) takes the form of a flat piece which, towards the attachment (30), has an offset or curvature directed towards the cutting line (27).
8. Hand machine tool according to claim 7, characterized in that the arm (10) at its other end is provided with an axle piece (26), which is directed at right angles to the swivelling plane (E2 - E2) and projects laterally relative to the saw blade (4).
9. Hand machine tool according to claim 8, characterized by a spring (40) which presses the end of the arm (10) provided with the cutting line indicator (11) against a workpiece (23).
10. Hand machine tool according to claim 8, characterized in that the axle piece (26) is mounted in an articulated fork (24), which is a connecting part between the protective cover (5) and the base plate (1).
11. Any of the hand machine tools substantially as herein described with reference to the accompanying drawings.



Application No: GB 9807143.4
Claims searched: 1-11

Examiner: Matthew Lawson
Date of search: 25 June 1998

**Patents Act 1977
Search Report under Section 17**

Databases searched:

UK Patent Office collections, including GB, EP, WO & US patent specifications, in:
UK Cl (Ed.P): B5L
Int Cl (Ed.6): B23D 45/16, 59/00; B23Q 9/00, 17/22; B27B 5/29, 9/04
Other: Online: WPI

Documents considered to be relevant:

Category	Identity of document and relevant passage	Relevant to claims
A	GB 0247305 (MICHEL) figures 5 & 6.	
Y	US 5461790 (OLSTOWSKI) column 5 lines 31-51 and figures 1-4.	1
Y	US 5375495 (BOSTEN) column 9 lines 1-15 and figures 6 & 7.	1

X Document indicating lack of novelty or inventive step	A Document indicating technological background and/or state of the art.
Y Document indicating lack of inventive step if combined with one or more other documents of same category.	P Document published on or after the declared priority date but before the filing date of this invention.
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