

(19)



(11)

**EP 1 852 227 B1**

(12)

**EUROPEAN PATENT SPECIFICATION**

(45) Date of publication and mention of the grant of the patent:  
**27.03.2013 Bulletin 2013/13**

(51) Int Cl.:  
**B27B 5/16** <sup>(2006.01)</sup> **B27G 19/04** <sup>(2006.01)</sup>  
**B23D 59/00** <sup>(2006.01)</sup>

(21) Application number: **07111827.7**

(22) Date of filing: **30.06.2005**

(54) **Blade guard assembly for a saw**

Sägeblattschutzanordnung

Ensemble de protection de lame pour scies

(84) Designated Contracting States:  
**AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HU IE IS IT LI LT LU MC NL PL PT RO SE SI SK TR**

(30) Priority: **07.07.2004 US 586039 P**

(43) Date of publication of application:  
**07.11.2007 Bulletin 2007/45**

(62) Document number(s) of the earlier application(s) in accordance with Art. 76 EPC:  
**05014124.1 / 1 614 511**

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## Description

**[0001]** This invention relates generally to a blade guard assembly for saws and more specifically to a blade guard assembly for a combination table/miter saw.

**[0002]** It is well known in the miter saw field to provide a blade guard assembly to cover a blade when the saw assembly is in an upper position. Typically such blade guard assembly is moved when the saw assembly is moved downwardly towards a workpiece. Such blade guard assembly is not typically used on table saws or combination table/miter saws. It is an object of the invention to provide an enhanced blade guard assembly for combination table/miter saws, and miter saws.

**[0003]** US 5927171 discloses a circular saw according to the preamble of claim 1.

**[0004]** According to the present invention, there is provided a power tool as defined by claim 1.

**[0005]** In accordance with the present invention, an improved support assembly is employed. The power tool has a base assembly, a table supported by the base assembly, a saw assembly pivotally attached to the table via a trunnion, the saw assembly including a motor, a blade driven by the motor, an upper blade guard covering an upper part of the blade, a lower blade guard pivotally attached to the upper blade guard for covering a lower part of the blade, an auxiliary blade guard pivotally attached to the lower blade guard, a link attached at one end to the trunnion and at the other end to the lower blade guard, an auxiliary link attached at one end to the link and at the other end to the auxiliary blade guard, and an uplock assembly comprising a guard lock movable between a first position contacting the lower blade guard and a second position not contacting the lower blade guard.

**[0006]** Additional features and benefits of the present invention are described, and will be apparent from, the accompanying drawings and the detailed description below.

**[0007]** The accompanying drawings illustrate preferred embodiments of the invention according to the practical application of the principles thereof, and in which:

FIG. 1 illustrates a combination table/miter saw according to the invention, whereas FIGS. 1A-1 B are side views of the combination table/miter saw in the miter saw and table saw modes, respectively; FIG. 2 illustrates the saw assembly with a blade guard assembly according to the invention, where FIGS. 2A-2B are left and right side views of such blade guard assembly, respectively; and FIG. 3 is a perspective view of a dust collector according to the invention.

**[0008]** The invention is now described with reference to the accompanying figures, wherein like numerals designate like parts. Referring to FIG. 1, a combination ta-

ble/miter saw 100 may include a base assembly 10, a table 11 supported by base assembly 10, and a saw assembly 20 supported by the table 11. Saw assembly 20 may include a trunnion 21 disposed on the table 11, a pivotable arm 22 pivotally attached to trunnion 21, a motor 24 supported by the arm 22 and driving a blade 23. Arm 22 also supports upper blade guard 27, which covers an upper part of blade 23. Lower blade guard 25 is pivotally attached to upper blade guard 27. An auxiliary blade guard 26 may be pivotally connected to lower blade guard 25.

**[0009]** Preferably, table 11 is pivotally attached to base assembly 10 via joint 15 so that, when the table 11 is in the orientation of FIG. 1A, the saw assembly 20 can act as a miter saw, i.e., saw assembly 20 can be pivoted downwardly towards table 11 to cut a workpiece placed on table 11. The user can use a handle 50 disposed on saw assembly 20 (e.g., on arm 22 and/or upper blade guard 27) to pivot saw assembly 20 downwardly towards table 11.

**[0010]** On the other hand, when table 11 is rotated via joint 15 to the orientation of FIG. 1 B, the saw 100 acts as a table saw, i.e., saw assembly 20 will be supported by and disposed underneath the table 11. In such orientation, blade 23 extends through the table 11, so that a user can dispose a workpiece on table 11 and push it towards blade 23 for cutting.

**[0011]** Persons skilled in the art will recognize that the invention described below can be applicable to non-combined miter saws.

**[0012]** Preferably, base assembly 10 has at least one wheel 13 thereon.

**[0013]** Base assembly 10 may also support four leg assemblies 30. Preferably leg assemblies 30 are pivotally attached to base assembly 10.

**[0014]** Referring to FIGS. 1-2, lower blade guard 25 is pivotally connected to upper blade guard 27 at pivot junction 25P. Auxiliary blade guard 26 is pivotally connected to lower blade guard 25 at pivot junction 26P.

**[0015]** A link 28 is pivotally connected at one end to trunnion 21 and to lower blade guard 25 at the other end. Preferably link 28 is made of metal. It is preferable that link 28 be pivotally connected to lower blade guard 25 at a pivot junction 28P. Pivot junction 25P is preferably disposed between the point in trunnion 21 connected to link 28 and pivot junction 28P. Furthermore, pivot junction 25P is preferably disposed underneath a line drawn between the point in trunnion 21 connected to link 28 and pivot junction 28P.

**[0016]** With such arrangement, when the saw assembly 20 is moved downwardly towards table 11, link 28 will pull lower blade guard 25, exposing blade 23 for the cutting operation.

**[0017]** An auxiliary link 29 is pivotally connected at one end to link 28 and to auxiliary blade guard 26 at the other end. Preferably auxiliary link 29 is made of metal. It is preferable that auxiliary link 29 be pivotally connected to auxiliary blade guard 25 at a pivot junction 29P. Pivot

junction 26P is preferably disposed between the point in auxiliary link 29 connected to link 28 and pivot junction 29P. Furthermore, pivot junction 26P is preferably disposed underneath a line drawn between the point in auxiliary link 29 connected to link 28 and pivot junction 29P.

**[0018]** Persons skilled in the art will recognize that it is also preferable that pivot junction 26P be disposed between pivot junctions 25P and 29P. Furthermore, pivot junction 26P is preferably disposed underneath a line drawn between the pivot junctions 25P and 29P.

**[0019]** Similarly, pivot junction 28P is preferably disposed between the point in auxiliary link 29 connected to link 28 and pivot junction 29P. Furthermore, pivot junction 28P is preferably disposed underneath a line drawn between the point in auxiliary link 29 connected to link 28 and pivot junction 29P.

**[0020]** With such arrangement, auxiliary blade guard 26 will move as lower blade guard 25 is rotating to expose the blade 23.

**[0021]** Preferably lower blade guard 25 moves over upper blade guard 27 and underneath auxiliary blade guard 26 when rotating.

**[0022]** Having such blade guard assembly covers more periphery of the blade 23 when the saw assembly 20 is in the upper position, while exposing more periphery of blade 23 (thus increasing cutting capacity) when the saw assembly 20 is in the lower position.

**[0023]** A handle 35 may be rotatably attached to link 28. A pull link 36 may be pivotally attached to handle 35 at one end and to auxiliary link 29 at the other end. With such arrangement, the user can rotate handle 35 to lift auxiliary blade guard 26 and/or lower blade guard 25.

**[0024]** This is especially useful when saw 100 is being used in table saw mode, as lower blade guard 25 and/or auxiliary blade guard 26 may be contacting the underside of table 11. Lower blade guard 25 and/or auxiliary blade guard 26 may prevent saw assembly 20 from beveling. The user can reach underneath table 11, pull handle 35, lifting auxiliary blade guard 26 and/or lower blade guard 25, allowing the saw assembly 20 to bevel.

**[0025]** Referring to FIG. 2B, an uplock assembly 40 may be provided on upper blade guard 27 to prevent saw assembly 20 from pivoting downwardly towards table 11 when saw 100 is being used in miter saw mode. Uplock assembly 40 may include a lever 41 disposed near handle 50 and pivotably connected to upper blade guard 27, a guard lock 43 pivotably attached to upper blade guard 27 and rotatable between a first position engaging lower blade guard 25 and a second position not engaging lower blade guard 25, and a link 42 connected to lever 41 at one end and to guard lock 43 at the other end.

**[0026]** With such arrangement, the user would need to rotate lever 41 towards handle 50, causing guard lock 43 to rotate towards the second position, i.e., away from lower blade guard 25, allowing lower blade guard 43 to rotate and thus allowing saw assembly 20 to rotate downwardly. If the user does not rotate lever 41 as described above, guard lock 43 will engage lower blade guard 25,

not allowing lower blade guard 25 to rotate and not allowing saw assembly 20 to rotate downwardly.

**[0027]** Persons skilled in the art will recognize that guard lock 43 may be designed to engage auxiliary blade guard 26 instead of or in addition to lower blade guard 25, and yet achieve the same result, i.e., not allowing saw assembly 20 to rotate downwardly until guard lock 43 is moved to the second position.

**[0028]** Persons skilled in the art will also recognize that a spring (not shown) should be provided to bias guard lock 43 towards the first position. Similarly, a spring (not shown) can be provided to lever 41 to bias it away from handle 50.

**[0029]** Because lower blade guard 25 typically does not contact arm 22, a rear guard is typically provided between arm 22 and lower blade guard 25 to cover the periphery of blade 23 therebetween. Dust duct assembly 60 is preferably provided on arm 22 to replace the typical rear guard.

**[0030]** Referring to FIGS. 1-3, dust duct assembly 60 may have two walls 61 substantially parallel to blade 23. These walls 61 are connected to a dust duct 63. Persons skilled in the art will recognize that walls 61 preferably define a chamber therebetween that is connected to a dust exhaust channel within dust duct 63. Preferably part of the periphery of blade 23 extends into such chamber.

**[0031]** Each wall 61 may have a secondary wall 62 extending towards blade 23. Secondary walls 62 may act as blade calipers, limiting the sideways motion of blade 23. Alternatively, secondary walls 62 may contact the body of blade 23 before the blade's teeth contact upper blade guard 27, lower blade guard 25 and/or auxiliary blade guard 26. Persons skilled in the art will recognize secondary walls will not necessarily lower the amount of dust received by the chamber (and/or by dust duct 63) as the blade periphery is preferably disposed between the dust duct 63 and the secondary walls 62.

**[0032]** Dust duct 63 may extend past and/or through arm 22, and may be connected to a hose connected to a vacuum source, or to an elbow 64 for redirecting the flow of dust moving through dust duct 63. Preferably dust duct 63 extends past, rather than through, arm 22. In this manner dust duct 63 does not interfere with the spring (not shown) biasing arm 22 (and saw assembly 20) to the upper position.

**[0033]** It is preferable to provide walls 65 pivotably attached to dust duct 63. Alternatively walls 65 may be pivotably attached to walls 61. Preferably a wall 65 is disposed adjacent to a wall 61 and/or on each side of dust duct 63. Both walls 65 may be connected via a boss 65B. Boss 65B may travel along an arcuate slot 61 S disposed on both walls 61.

**[0034]** With such arrangement, movable walls 65 can pivot from a lower position to an upper position. Preferably, at least one spring 67 biases walls 65 towards the lower position. Walls 65 can pivot upwardly when lower blade guard 25 is in the original position contacting walls 65 (see FIG. 2A). Walls 65 can also pivot upwardly when

one wall 65 contacts a fence 16 during a beveling operation.

**[0035]** A resilient flap 66 may be connected to dust duct 63. Preferably flap 66 is disposed underneath walls 61 and 65 to provide a bottom wall to the chamber defined by walls 61.

**[0036]** Persons skilled in the art will recognize that dust duct 63 and/or walls 61 may be attached to arm 22.

## Claims

### 1. A power tool (100) comprising:

a base assembly (10);  
 a table (11) supported by the base assembly;  
 a saw assembly (20) pivotally attached to the table via a trunnion (21), the saw assembly including a motor (24), a blade (23) driven by the motor, an upper blade guard (27) covering an upper part of the blade, and a dust duct (60) disposed between the trunnion and the upper blade guard;  
 wherein the dust duct comprises first and second walls (65) pivotally attached to the dust duct;  
**characterized by** a resilient flap (66) attached to the dust duct and disposed underneath the first and second walls to provide a bottom wall to a chamber defined by said first and second walls.

2. The power tool of Claim 1, wherein the dust duct further comprises third and fourth walls (61) attached to the dust duct.

3. The power tool of Claim 2, wherein the first and second walls are pivotally attached to the third and fourth walls, respectively.

4. The power tool of Claim 2, wherein the third and fourth walls are disposed on each side of the blade, respectively.

5. The power tool of Claim 1, wherein the first and second walls are disposed on each side of the blade, respectively.

6. The power tool of Claim 1, further comprising a fence (16) disposed above the table.

7. The power tool of Claim 6, wherein at least one of the first and second walls can contact the fence.

8. The power tool of Claim 1, wherein the table is pivotally supported by the base assembly.

9. The power tool of Claim 8, wherein the table pivots

about a horizontal axis.

## Patentansprüche

### 1. Elektrowerkzeug (100), umfassend:

eine Basisanordnung (10),  
 einen Tisch (11), der auf der Basisanordnung aufliegt,  
 eine Sägenanordnung (20), die über einen Drehzapfen (21) schwenkbar am Tisch befestigt ist, wobei die Sägenanordnung einen Antrieb (24), ein vom Antrieb angetriebenes Blatt (23), einen oberen Blattschutz (27), der einen oberen Teil des Blattes bedeckt, und eine Spanführung (60), die zwischen dem Drehzapfen und dem oberen Blattschutz angeordnet ist, aufweist, wobei die Spanführung eine erste und eine zweite Wand (65) umfasst, die schwenkbar an der Spanführung befestigt sind,  
**gekennzeichnet durch** eine elastische Klappe (66), die an der Spanführung befestigt ist und unter der ersten und der zweiten Wand angeordnet ist, um eine Bodenwand für eine Kammer bereitzustellen, die von der ersten und der zweiten Wand gebildet wird.

2. Elektrowerkzeug nach Anspruch 1, wobei die Spanführung ferner eine dritte und eine vierte Wand (61) umfasst, die an der Spanführung befestigt sind.

3. Elektrowerkzeug nach Anspruch 2, wobei die erste und die zweite Wand schwenkbar an der dritten beziehungsweise der vierten Wand befestigt sind.

4. Elektrowerkzeug nach Anspruch 2, wobei die dritte und die vierte Wand zu beiden Seiten des Blattes angeordnet sind.

5. Elektrowerkzeug nach Anspruch 1, wobei die erste und die zweite Wand zu beiden Seiten des Blattes angeordnet sind.

6. Elektrowerkzeug nach Anspruch 1, ferner eine Absperrung (16) umfassend, die über dem Tisch angeordnet ist.

7. Elektrowerkzeug nach Anspruch 6, wobei die erste und/oder die zweite Wand die Absperrung berühren kann beziehungsweise können.

8. Elektrowerkzeug nach Anspruch 1, wobei der Tisch schwenkbar auf der Basisanordnung aufliegt.

9. Elektrowerkzeug nach Anspruch 8, wobei der Tisch um eine horizontale Achse schwenkt.

## Revendications

1. Outil électrique (100), comprenant :
  - un ensemble de base (10) ; 5
  - une table (11) supportée par l'ensemble de base ;
  - un ensemble de scie (20) fixé à pivotement à la table 10
  - via un tourillon (21), l'ensemble de scie comprenant un moteur (24), une lame (23) entraînée par le moteur, un garde-lame supérieur (27) couvrant une partie supérieure de la lame et un conduit à poussière (60) disposé entre le tourillon et la garde-lame supérieur ; 15
  - dans lequel le conduit à poussière comprend une première et une seconde paroi (65) fixées à pivotement au conduit de poussière ;
  - caractérisé par** un volet élastique (66) fixé au conduit à poussière et disposé en dessous de la première et de la deuxième paroi pour fournir une paroi de fond à une chambre définie par lesdites première et deuxième parois. 20
2. Outil électrique selon la revendication 1, dans lequel le conduit à poussière comprend en outre une troisième et une quatrième paroi (61) fixées au conduit à poussière. 25
3. Outil électrique selon la revendication 2, dans lequel la première et la deuxième paroi sont fixées à pivotement à la troisième et à la quatrième paroi, respectivement. 30
4. Outil électrique selon la revendication 2, dans lequel la troisième et la quatrième paroi sont disposées sur chaque côté de la lame, respectivement. 35
5. Outil électrique selon la revendication 1, dans lequel la première et la deuxième paroi sont disposées sur chaque côté de la lame, respectivement. 40
6. Outil électrique selon la revendication 1, comprenant en outre une barrière (16) disposée au-dessus de la table. 45
7. Outil électrique selon la revendication 6, dans lequel au moins l'une des première et deuxième parois peut venir en contact avec la barrière. 50
8. Outil électrique selon la revendication 1, dans lequel la table est supportée à pivotement par l'ensemble de base. 55
9. Outil électrique selon la revendication 8, dans lequel la table pivote autour d'un axe horizontal.

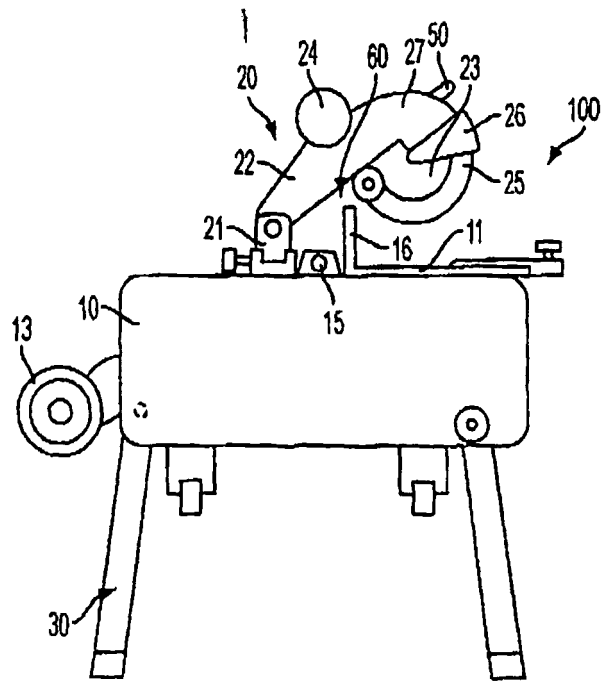


FIG. 1A

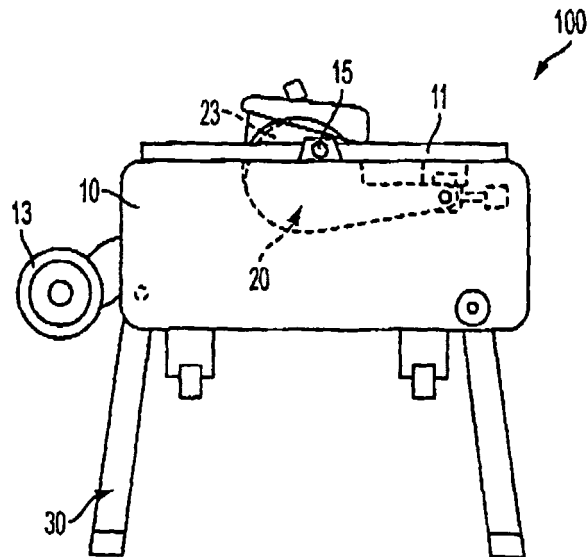


FIG. 1B

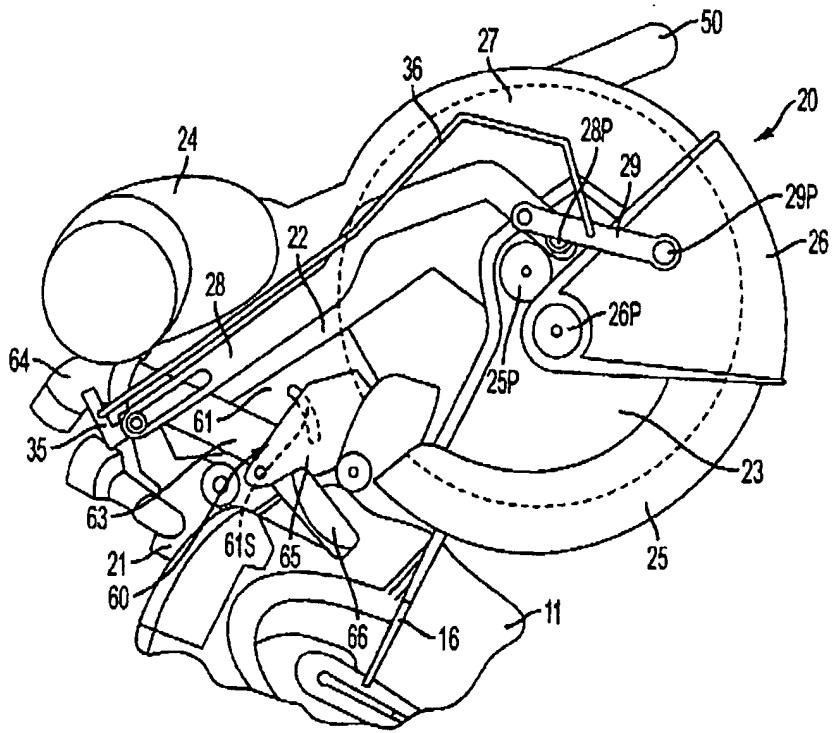


FIG. 2A

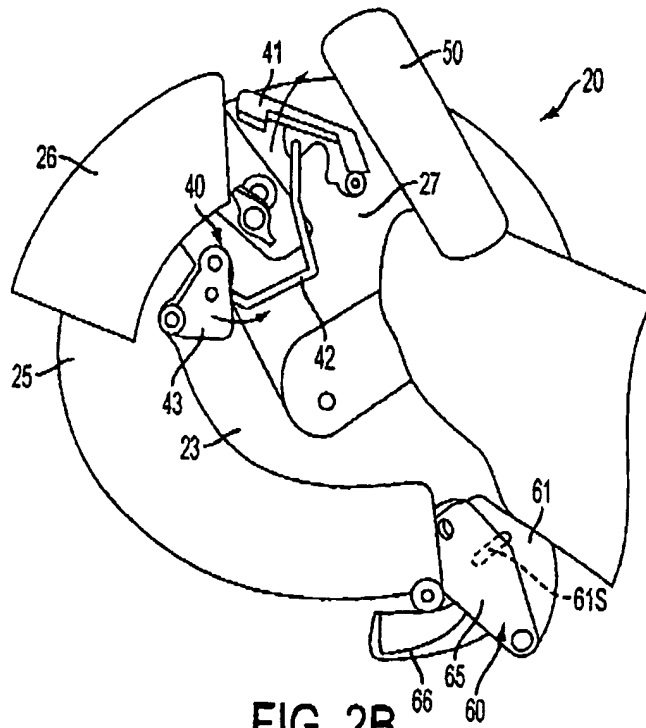


FIG. 2B

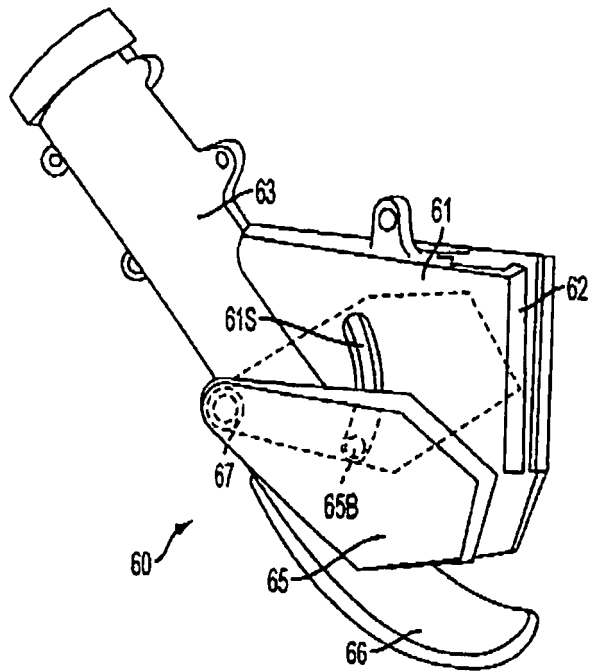


FIG. 3

**REFERENCES CITED IN THE DESCRIPTION**

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**Patent documents cited in the description**

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