

**PatBase - Search results** 12 May 2017

**Search query (39):** PN=(US2009026047 or US2002175050 or JP8258940 or US5129508 or US6575294 or US2004031666 or KR101217892 or JP2007131427 or WO16000742 or JP7277439 or US5007528 or JP8258941 or JP10329921 or KR20100096698 or KR101296677 or KR101332026 or KR101526544 or KR101564376 or KR100846666 or KR20030046187 or KR101526544 or JP6115656 or JP8258940 or US2010072034 or US2009250323 or DE2416963 or WO9109798 or JP2061812U)

**Results:** 26

**Search history**

Search PN=(wo2014018659) (Results 1)

1:

Search PN=(WO2014206878) (Results 1)

2:

Search fn=(61320982 or 32223991 or 2116033 or 3140974 or 11759764 or 15282543 or 49558808 or 22887603 or 14926201 or 49558808 or 30105752) (Results 10)

Search fn=(52654998 or 55601019 or 59704646 or 55473294 or 55473294 or 40813306 or 34691854 or 40772103 or 41496124 or 41496124 or 65131357 or 52786889 or 40813306 or 43650775 or 40813306 or 40813306 or 41005193 or 43650775 or 55473294 or 61320982) (Results 13)

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5:

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Search fn=(13857115 or 13857115 or 42392512 or 55195402) (Results 3)

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Search SEALING AND DEVICE AND TRANSFER AND LOCATION (Results 2462)

17:

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18:

Search SEALING DEVICE FOR A BELT TRANSFER LOCATION (Results 1)

19:

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Search (system and "shutter" and (conveyer belt)) (Results 22)  
27:  
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Search (IPC=(B65G15/08) AND 27) (Results 0)  
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Search mechanism and shutter (Results 29109)  
30:  
Search shutter and band and conveyor (Results 246)  
31:  
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33:  
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34:  
Search 27 and 30 (Results 8)  
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Search convoyeur (Results 20302)  
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39:

**Title:** BANDFOERDERGERAET MIT DICHTUNGSSCHUERZEN BANDFOERDERGERAET ORES WITH SEAL PROTECTION (Machine translation)

**Abstract:** Source: DE2416963A1 Patentansprueche 1) Bandfoerdergeraet mit starren Seitenwaenden, die ueber den Raendern des Bandes angeordnet sind und an ihren unteren Seiten mit flexiblen Dichtungsschuerzen versehen sind, deren untere Raender auf dem Band reibend anliegen, dadurch gekennzeichnet, dass die Dichtungsschuerzen an beweglichen Wandteilen befestigt sind, die durch ihr Eigengewicht oder durch aehnlich wirkende Einrichtungen gegen das Band druecken, derart, dass die Dichtungsschuerzen in staendiger Beruehrung mit dem Band gehalten werden 2) Bandfoerdergeraet nach Anspruch 1, dadurch gekennzeichnet, dass jeder eine Dichtungsschuerze tragende bewegliche Wandteil von wenigstens zwei parallelen Armen gehalten ist, die geneigt angeordnet und gelenkig an dem Wandteil und auf einer festen Stuetze gelagert sind, um den beweglichen Wandteil zu ermoeeglichen, sich unter der Wirkung des Eigengewichts oder einer aehnlich wirkenden Einrichtung, dem Band zu naehern 3) Bandfoerdergeraet nach Anspruch 1 oder 2, dadurch gekennzeichnet, dass das Gewicht des beweglichen Wandteils teilweise durch ein Gegengewicht ausgeglichen ist 4) Bandfoerdergeraet nach Anspruch 1 oder 2, dadurch gekennzeichnet, dass die beweglichen Wandteile durch Federn oder aehnlich wirkende Einrichtungen gegen das Band gedruickt oder entlastet werden 5) Bandfoerdergeraet nach Anspruch 1, 2, 3 oder 4, dadurch gekennzeichnet, dass ein Anschlag die Verschiebung des beweglichen Wandteiles gegen das Band begrenzt, um den Wandteil daran zu hindern, mit demselben direkt in Beruehrung zu kommen 6) Bandfoerdergeraet nach Anspruch 5, dadurch gekennzeichnet, dass ein Kontakt, der am Anschlag angebracht ist, eine Signaleinrichtung betaetigt, wenn der bewegliche Wandteil seine untere Grenzstellung erreicht 7) Bandfoerdergeraet nach Anspruch 2, dadurch gekennzeichnet, dass einer der Arme mit einem Hebel verbunden ist, der ein Gegengewicht traegt, welches teilweise das Gewicht des beweglichen Wandteiles ausgleicht, dass ein Anschlag die Drehung des Hebels begrenzt, um den beweglichen Wandteil an der Beruehrung mit dem Band zu hindern, und dass ein Kontakt eine Signaleinrichtung betaetigt, wenn der Hebel den Anschlag beruehrt 8) Bandfoerdergeraet nach Anspruch 1, dadurch gekennzeichnet, dass der bewegliche Wandteil von einem hierzu parallelen festen Wandteil gehalten ist und eine Dichtung zwischen den beweglichen und festen Wandteilen vorgesehen ist 9) Bandfoerdergeraet nach Anspruch 8, dadurch gekennzeichnet, dass die Dichtung aus einem flexiblen Band besteht, welches an einem der Bauteile befestigt ist und an dem anderen Bauteil durch sein Gewicht oder seine Elastizitaet anliegt 10) Bandfoerdergeraet nach Anspruch 1, dadurch gekennzeichnet, dass das Foerderband in dem Bereich der Andruckszonen der Dichtungsschuerzen durch laengliche Gleitflaechen unterstuetzt ist Leerseite.

**Machine translation:** CLAIMS 1) Bandfoerdergeraet with rigid side walls that are above the edges of the tape and is provided at their lower sides with flexible seal training ores are applied their lower edges rubbing on the belt, characterized in that the seal training ores are mounted on movable wall parts, to push through their own weight or click like acting facilities against the band, such that the seal training ores are kept in constant contact with the band 2) Bandfoerdergeraet according to claim 1, wherein each one Dichtungsschuerze supporting movable wall portion of at least two parallel arms held is arranged inclined and hinged to the wall portion and on a solid support to the movable wall portion to allow union, under the action of its own weight or a similar-looking device, to get close to the band 3) Bandfoerdergeraet according to claim 1 or 2, characterized in that the weight of the moveable wall portion partially balanced by a counterweight 4) Bandfoerdergeraet is characterized labeled according to claim 1 or 2, wherein the movable wall parts with springs or similar-looking devices to prevent the tape must be pressed or released 5) Bandfoerdergeraet according to claim 1, 2, 3 or 4, characterized in that a stop limits the movement of the movable wall part against the belt to prevent the wall part because of the same right to come into contact 6) marked Bandfoerdergeraet according to claim 5, wherein that a contact that is attached at the end, a signal actuated device when the movable wall portion reaches its lower limit position 7) Bandfoerdergeraet according to claim 2, wherein one of the arms is connected to a lever, which carries a counterweight, which partially the weight of be balancing movable wall part, that a stop limits the rotation of the lever to prevent the movable wall part at the contact with the band, and that contact activates a signaling device, when the lever to the on on impact touched 8) Bandfoerdergeraet claim 1, wherein the movable wall portion is held by a parallel thereto fixed wall portion and a seal between the movable and fixed wall portions provided is 9) Bandfoerdergeraet according to claim 8, wherein the gasket comprises a flexible band, which at one of the components is fixed and the other component by its weight or its elasticity is applied 10) Bandfoerdergeraet according to claim 1, wherein the conveyor belt in the area of the seal training Andruckszonen ores is supported by elongated sliding blank page.

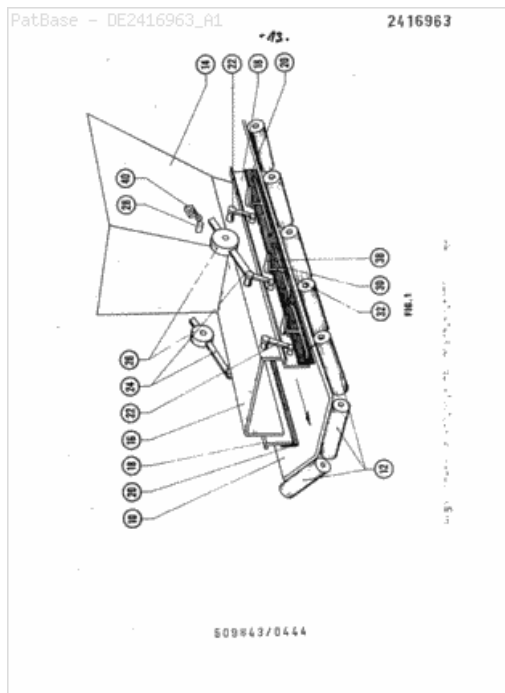
#### Classifications:

**International (IPC 8-9):** B65G21/20 (Advanced/Invention); B65G21/20 (Core/Invention)

**International (IPC 1-7):** B65G47/18

**CPC:** B65G21/2081

**European:** B65G21/20D2B1



#### Family:

| Publication number | Publication date | Application number | Application date |
|--------------------|------------------|--------------------|------------------|
| DE2416963 A1       | 19751023         | DE19742416963      | 19740408         |

#### Priority:

DE19742416963 19740408

**Probable Assignee:** FIVES CAIL BABCOCK

**Assignee(s):** (std): FIVES CAIL BABCOCK  
**Assignee(s):** SOCIETE FIVES CAIL BABCOCK PARIS  
**Inventor(s):** (std): RITZ GEORGES  
**Inventor(s):** RITZ GEORGES VINCENNES FRANKREICH

**Legal status (INPADOC)**

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| Patent       | Date recorded | Event group | Code | Event                         | Details |
|--------------|---------------|-------------|------|-------------------------------|---------|
| DE2416963 A1 | 19751023      | LSPB        | +    | published / reissued          |         |
| DE2416963 A1 | 19810205      | LSLE        | -OHJ | NON-PAYMENT OF THE ANNUAL FEE |         |

**Title:** Belt conveyor supporting arrangement

**Abstract:** Source: US5007528A A belt conveyor supporting arrangement includes three main components for preventing the belt from being damaged. The first component is a backing bed apparatus comprising a smooth slidable top plate having plural air flow channels at the surface thereof which is supported by a cushion plate. The second component is a skirt plate device for shutting the opening between the surface of the belt and the chute with little contact friction. The third component is a bending tension return-roller apparatus M3 comprising a pair of rollers inclined like the symbol [ ] and having a device for adjusting the angles thereof.

**Classifications:**

**International (IPC 8-9):** B65G15/08 B65G15/60 B65G15/62

B65G21/20 B65G69/00 B65G69/18 (Advanced/Invention);

B65G69/00 (Advanced/Non-invention);

B65G15/60 B65G21/20 B65G69/00 (Core/Invention)

**International (IPC 1-7):** B65G15/08 B65G15/62 B65G21/00

B65G21/20 B65G39/16 B65G47/52 B65G69/00 B65G69/18

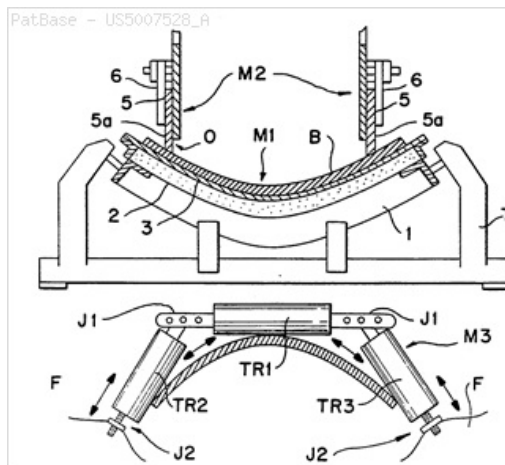
**CPC:** B65G15/60 B65G15/62 B65G21/2081 B65G69/185

B65G2201/04 B65G2207/28

**European:** B65G15/60 B65G15/62 B65G21/20D2B1 B65G69/18D

L65G201/04 L65G207/28

**US:** 198/823 198/826 198/841



**Family:**

| Publication number | Publication date | Application number | Application date |
|--------------------|------------------|--------------------|------------------|
| AU198937391 A1     | 19900105         | AU19890037391      | 19890603         |
| AU626555 B2        | 19920806         | AU19890037391      | 19890603         |
| CA1305938 A1       | 19920804         | CA19890601766      | 19890605         |
| CN1014313 B        | 19911016         | CN19891003883      | 19890605         |
| CN1039391 A        | 19900207         | CN19891003883      | 19890605         |
| DE68917722 D1      | 19940929         | DE19896017722      | 19890603         |
| DE68917722 T2      | 19950302         | DE19896017722T     | 19890603         |
| EP0406425 A1       | 19910109         | EP19890906453      | 19890603         |
| EP0406425 A4       | 19911113         | EP19890906453      | 19890603         |
| EP0406425 B1       | 19940824         | EP19890906453      | 19890603         |
| JP2086502 A2       | 19900327         | JP19890141900      | 19890603         |
| JP2573874 B2       | 19970122         | JP19890141900      | 19890603         |
| US5007528 A        | 19910416         | US19890361365      | 19890605         |
| WO8912012 A1       | 19891214         | WO1989JP00563      | 19890603         |

**Priority:**

CA19890601766 19890605 JP19880074917 19880605 WO1989JP00563 19890603  
JP19880074917U 19880605

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**Agent(s):** DAVIES COLLISON CAVE; DAVIES COLLISON CAVE PTY LTD; KIRBY EADES GALE BAKER

**Designated states:** AU BR DE GB SE SU

**Legal status (INPADOC)**

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| Patent         | Date recorded | Event group | Code  | Event                                                      | Details |
|----------------|---------------|-------------|-------|------------------------------------------------------------|---------|
| AU198937391 A1 | 19900105      | LSPB        | +     | published / reissued                                       |         |
| AU626555 B2    | 19920806      | LSGT        | +     | granted / extensions (spc, cpc, pte)                       |         |
| CA1305938 A1   | 19920804      | LSGT        | +     | granted / extensions (spc, cpc, pte)                       |         |
| CA1305938 A1   | 19980804      | LSLE        | -MKLA | LAPSED                                                     |         |
| CN1014313 B    | 19911016      | LSPB        | +     | published / reissued                                       |         |
| CN1014313 B    | 19900207      | LSPB        | +C06  | PUBLICATION                                                |         |
| CN1014313 B    | 19920701      | LSGT        | +C14  | GRANT OF PATENT OR UTILITY MODEL                           |         |
| CN1014313 B    | 19980812      | LSLE        | -C19  | LAPSE OF PATENT RIGHT DUE TO NON-PAYMENT OF THE ANNUAL FEE |         |

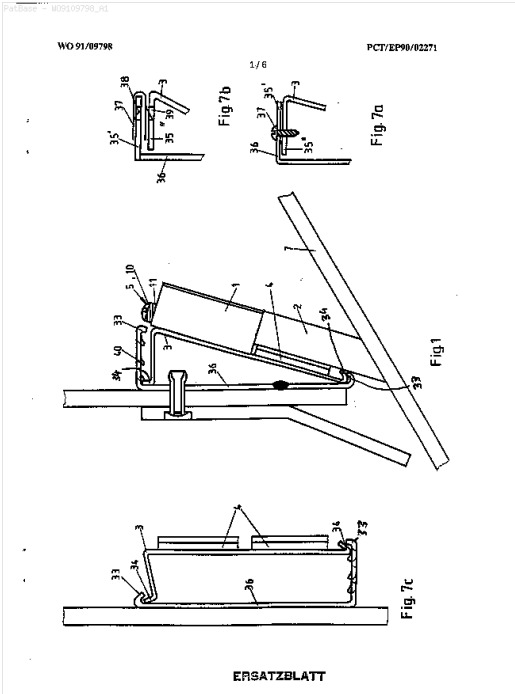
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|---------------|----------|------|-------|---------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| CN1039391 A   | 19900207 | LSPB | +     | published / reissued                                                                  |                                                                                                                                                                                                           |
| DE68917722 D1 | 19950921 | LSGT | +8364 | NO OPPOSITION DURING TERM OF OPPOSITION                                               |                                                                                                                                                                                                           |
| DE68917722 D1 | 19960613 | LSLE | -8339 | CEASED/NON-PAYMENT OF THE ANNUAL FEE                                                  |                                                                                                                                                                                                           |
| DE68917722 T2 | 19950302 | LSGT | +     | granted / extensions (spc, cpc, pte)                                                  |                                                                                                                                                                                                           |
| EP0406425 A1  | 19910109 | LSPB | +     | published / reissued                                                                  |                                                                                                                                                                                                           |
| EP0406425 A1  | 19910109 | LSES | +17P  | REQUEST FOR EXAMINATION FILED                                                         | EFFECTIVE DATE : 19900508                                                                                                                                                                                 |
| EP0406425 A1  | 19911113 | LSES | +A4   | DESPATCH OF SUPPLEMENTARY SEARCH REPORT                                               | EFFECTIVE DATE : 19910923                                                                                                                                                                                 |
| EP0406425 A1  | 19930310 | LSES | +17Q  | FIRST EXAMINATION REPORT                                                              | EFFECTIVE DATE : 19930125                                                                                                                                                                                 |
| EP0406425 A1  | 19941124 | LSLE | -PG25 | LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO | REF COUNTRY CODE : SE<br>EFFECTIVE DATE : 19941124                                                                                                                                                        |
| EP0406425 A1  | 19950603 | LSLE | -PG25 | LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO | REF COUNTRY CODE : GB<br>EFFECTIVE DATE : 19950603                                                                                                                                                        |
| EP0406425 A1  | 19950816 | LSGT | +26N  | NO OPPOSITION FILED                                                                   |                                                                                                                                                                                                           |
| EP0406425 A1  | 19960131 | LSLE | -GBPC | GB: EUROPEAN PATENT CEASED THROUGH NON-PAYMENT OF RENEWAL FEE                         | EFFECTIVE DATE : 19950603                                                                                                                                                                                 |
| EP0406425 A1  | 19960301 | LSLE | -PG25 | LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO | REF COUNTRY CODE : DE<br>EFFECTIVE DATE : 19960301                                                                                                                                                        |
| EP0406425 B1  | 19940824 | LSGT | +     | granted / extensions (spc, cpc, pte)                                                  |                                                                                                                                                                                                           |
| JP2086502 A2  | 19900327 | LSPB | +     | published / reissued                                                                  |                                                                                                                                                                                                           |
| JP2573874 B2  | 19970122 | LSGT | +     | granted / extensions (spc, cpc, pte)                                                  |                                                                                                                                                                                                           |
| US5007528 A   | 19910416 | LSGT | +     | granted / extensions (spc, cpc, pte)                                                  |                                                                                                                                                                                                           |
| US5007528 A   | 19890718 | LSAS | AS    | ASSIGNMENT                                                                            | OWNER NAME : YOKO CO., LTD., 1378, KIBA HIMEJI-SHI, HYOGO 670 J<br>DESCRIPTION : ASSIGNMENT OF ASSIGNORS INTEREST.; ASSIGNOR: HIDEHARU, NAGAHAMA;<br>REEL/FRAME: 005102/0195<br>EFFECTIVE DATE : 19890629 |
| US5007528 A   | 19940929 | LSFE | +FPAY | FEE PAYMENT                                                                           | YEAR OF FEE PAYMENT : 4                                                                                                                                                                                   |
| US5007528 A   | 19990418 | LSLE | -LAPS | LAPSE FOR FAILURE TO PAY MAINTENANCE FEES                                             |                                                                                                                                                                                                           |
| US5007528 A   | 19990817 | LSLE | -FP   | EXPIRED DUE TO FAILURE TO PAY MAINTENANCE FEE                                         | EFFECTIVE DATE : 19990416                                                                                                                                                                                 |
| WO8912012 A1  | 19891214 | LSPB | +     | published / reissued                                                                  |                                                                                                                                                                                                           |
| WO8912012 A1  | 19900508 | LSNP | +WWE  | WIPO INFORMATION: ENTRY INTO NATIONAL PHASE                                           | REF DOCUMENT NUMBER : 1989906453<br>COUNTRY OF REF DOCUMENT : EP                                                                                                                                          |
| WO8912012 A1  | 19910109 | LSPB | +WWP  | WIPO INFORMATION: PUBLISHED IN NATIONAL OFFICE                                        | REF DOCUMENT NUMBER : 1989906453<br>COUNTRY OF REF DOCUMENT : EP                                                                                                                                          |
| WO8912012 A1  | 19940824 | LSGT | +WWG  | WIPO INFORMATION: GRANT IN NATIONAL OFFICE                                            | REF DOCUMENT NUMBER : 1989906453<br>COUNTRY OF REF DOCUMENT : EP                                                                                                                                          |

Title: SEALING SYSTEM FOR BELT CONVEYOR DELIVERY CHUTES AND THE LIKE

**Abstract:** To obtain a more universal and more effective sealing system, preferably for sealing the lower edge of a belt conveyor delivery chute from the rubber belt conveyor running below the chute, the sealing system consists of at least one supporting plate (3), a holding device made of a comparatively rigid material which can be moved by guides (4) relative to the supporting plate (3) essentially perpendicular to a gap to be sealed, at least one fastening element for stopping the holding device (1) relative to the supporting plate (3) and a sealing element made of a comparatively flexible material, in particular an elastomeric plastic, which is or can be interchangeably fastened in the holding device (1) and which has a sealing lip (2).

Classifications:

**International (IPC 8-9):** B65G21/20 (Advanced/Invention);  
B65G21/20 (Core/Invention)  
**International (IPC 1-7):** B65G21/20 B65G45/10 B65G47/76  
B65G69/18  
**CPC:** B65G21/2081  
**European:** B65G21/20D2B1



Family:

| Publication number | Publication date | Application number | Application date |
|--------------------|------------------|--------------------|------------------|
| AU199170444 A1     | 19910724         | AU19910070444      | 19901220         |
| DE8915169 U1       | 19910425         | DE19890015169U     | 19891223         |
| WO9109798 A1       | 19910711         | WO1990EP02271      | 19901220         |

Priority:

DE19890015169U 19891223      DE19898915169 19891223      WO1990EP02271 19901220

**Probable Assignee:** VSR ENGINEERING GMBH FOERDERTECHNIK 4330 MUELHEIM DE

**Assignee(s):** (std): VSR ENG FOERDERTECHNIK ; VSR ENGINEERING GMBH FORDERTECHNIK

**Assignee(s):** VSR ENGINEERING GMBH FOERDERTECHNIK ; VSR ENGINEERING GMBH FOERDERTECHNIK 4330 MUELHEIM ; VSR ENGINEERING GMBH FOERDERTECHNIK 4330 MUELHEIM DE

**Inventor(s):** (std): ALBERT RAPPEN ; RAPPEN ALBERT

**Designated states:** AT AU BE CH DE DK ES FR GB GR IT JP LU NL SE US

Legal status (INPADOC)

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| Patent         | Date recorded | Event group | Code | Event                                | Details |
|----------------|---------------|-------------|------|--------------------------------------|---------|
| AU199170444 A1 | 19910724      | LSPB        | +    | published / reissued                 |         |
| DE8915169 U1   | 19910425      | LSGT        | +    | granted / extensions (spc, cpc, pte) |         |
| WO9109798 A1   | 19910711      | LSPB        | +    | published / reissued                 |         |

**Title:** Dust control system

**Abstract:** Source: US5129508A A generally L-shaped cowling attached to a hood of a conveyor apparatus partially defining a dead air space and having a clamping device attached thereto with a latch which is secured by a securing element for attaching a skirt.

**Classifications:**

**International (IPC 8-9):** B65G15/18 B65G21/08

B65G21/20 (Advanced/Invention);

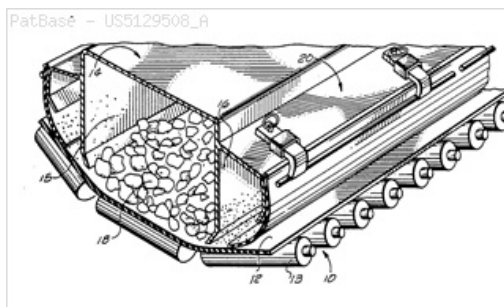
B65G21/20 (Core/Invention)

**International (IPC 1-7):** B65G15/18 B65G21/00 B65G21/08

**CPC:** B65G21/2081

**European:** B65G21/20D2B1

**US:** 198/836.1 198/860.3



**Family:**

| Publication number | Publication date | Application number | Application date |
|--------------------|------------------|--------------------|------------------|
| CA2048294 AA       | 19920926         | CA19912048294      | 19910801         |
| US5129508 A        | 19920714         | US19910680102      | 19910325         |

**Priority:**

CA19912048294 19910801

US19910680102 19910325

**Probable Assignee:**

SHELSTAD KEITH

**Assignee(s):** (std):

SHELSTAD KEITH

**Inventor(s):** (std):

SHELSTAD KEITH

**Agent(s):**

BORDEN LADNER GERVAIS LLP

**Legal status (INPADOC)**

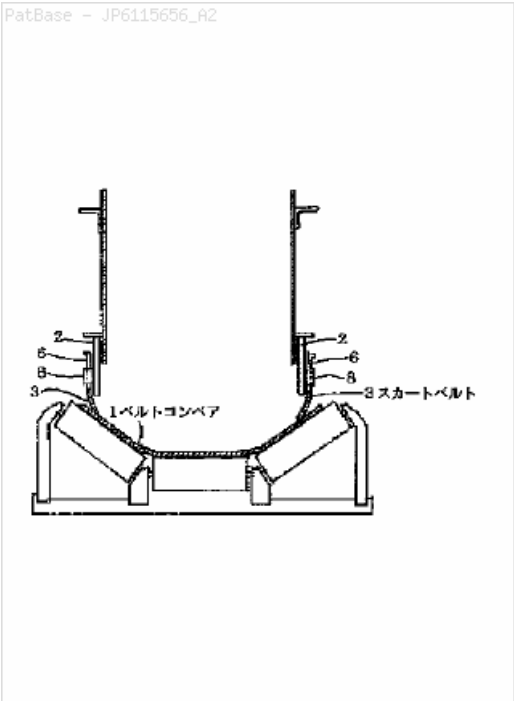
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| Patent       | Date recorded | Event group | Code  | Event                                | Details                  |
|--------------|---------------|-------------|-------|--------------------------------------|--------------------------|
| CA2048294 AA | 19920926      | LSPB        | +     | published / reissued                 |                          |
| CA2048294 AA | 19980601      | LSSES       | +EEER | EXAMINATION REQUEST                  |                          |
| CA2048294 AA | 20000801      | LSLE        | -FZDE | DEAD                                 |                          |
| US5129508 A  | 19920714      | LSGT        | +     | granted / extensions (spc, cpc, pte) |                          |
| US5129508 A  | 19960102      | LSFE        | +FPAY | FEE PAYMENT                          | YEAR OF FEE PAYMENT : 4  |
| US5129508 A  | 20000403      | LSFE        | +FPAY | FEE PAYMENT                          | YEAR OF FEE PAYMENT : 8  |
| US5129508 A  | 20040113      | LSFE        | +FPAY | FEE PAYMENT                          | YEAR OF FEE PAYMENT : 12 |

**Title:** CONSTRUCTION OF DUST PROTECTION SKIRT PART FOR BELT CONVEYOR

**Abstract:** Source: JP6115656A **PURPOSE:** To provide a construction of a dust protection skirt part by which appropriate contact pressure is always held on both side of the surface of a belt conveyor, and contact pressure adjusting work of a skirt belt due to wear is dispensable. **CONSTITUTION:** Side plates 2, 2 are provided on both side of a conveying passage by means of a belt conveyor 1, and dust protection skirt belts 3 are provided along the lower edges of the side plates 2. The skirt belt 3 is fitted slidably in the vertical direction against the side plate 2, the skirt belt 3 is contactedly pressed on the surface of the belt conveyor by its dead weight, and hence the skirt belt 3 is constituted so as to automatically descend, even if the lower end edge of the skirt belt 3 is worn.

**Classifications:**  
**International (IPC 8-9):** B65G21/20 B65G69/18 (Advanced/Invention)  
**International (IPC 1-7):** B65G21/20 B65G69/18  
**CPC:** B65G21/2081  
**European:** B65G21/20D2B1



**Family:**

| Publication number | Publication date | Application number | Application date |
|--------------------|------------------|--------------------|------------------|
| JP6115656 A2       | 19940426         | JP19920296485      | 19921007         |

**Priority:**  
JP19920296485 19921007

**Probable Assignee:** MURATA SHOKAI KK  
**Assignee(s):** (std): MURATA SHOKAI KK  
**Inventor(s):** (std): MURATA YASU HARU

**Legal status (INPADOC)**

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| Patent       | Date recorded | Event group | Code | Event                | Details |
|--------------|---------------|-------------|------|----------------------|---------|
| JP6115656 A2 | 19940426      | LSPB        | +    | published / reissued |         |

**Title:** SUPPORT DEVICE OF BELT CONVEYOR TRANSFER PART

**Abstract:** Source: JP7277439A PURPOSE: To provide a support device of a belt conveyor transfer part to prevent scattering and falling of an article to convey between a skirt rubber and a conveyor belt and easy to correspond with operational abnormality and maintain. CONSTITUTION: A support member to incline and support both side surfaces of a belt 15 at an upward angle in exchange of a carrier roller is provided on both sides of the carrier roller 8 provided on the central part. The support member is installed on a frame 4 and consists of two pieces of rotating drums 2 and a miniature belt 1, and the miniature belt 1 infinitely moves in the same direction of the belt 15. A lift device 7 is provided on one end of the support frame 4, the belt 15 is pressurized on a skirt rubber 12, and the support frame 4 is formed free to be inserted into or released from a frame of a belt conveyor. Additionally, a tension grip 5 is provided on the miniature belt 1.

**Classifications:**

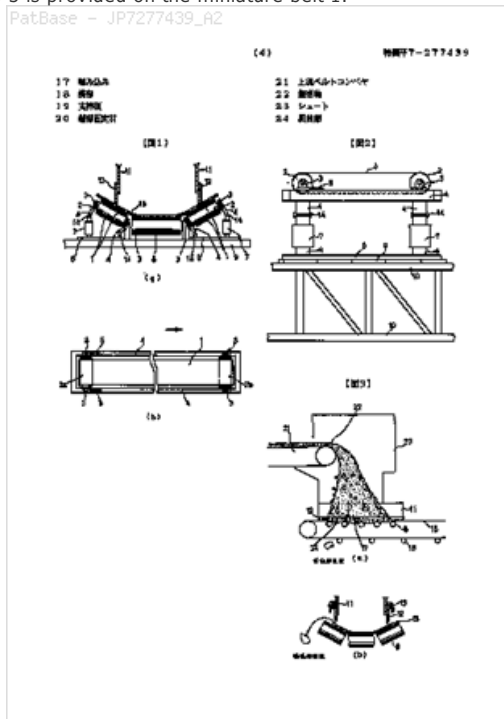
**International (IPC 8-9):** B65G15/08 B65G15/60 B65G21/00  
B65G21/20 B65G69/18 (Advanced/Invention);  
B65G15/08 B65G15/60 B65G21/00 B65G21/20  
B65G69/00 (Core/Invention)

**International (IPC 1-7):** B65G15/08 B65G15/60 B65G21/00  
B65G21/20 B65G69/18

**CPC:** B65G21/2081

**European:** B65G21/20D2B1

PatBase - JP7277439\_A2



**Family:**

| Publication number | Publication date | Application number | Application date |
|--------------------|------------------|--------------------|------------------|
| JP2752579 B2       | 19980518         | JP19940065135      | 19940401         |
| JP7277439 A2       | 19951024         | JP19940065135      | 19940401         |

**Priority:**

JP19940065135 19940401

**Probable Assignee:** NIPPON KOKAN KK

**Assignee(s):** (std): JFE ENGINEERING CORP ; KAWASAKI STEEL CO ; NIPPON KOKAN KK ; SUMITOMO METAL IND ; KOBE STEEL LTD

**Assignee(s):** NKK CORP ; SUMITOMO KINZOKU KOGYO KK ; SUMITOMO METAL IND LTD ; KOBE SEIKOSHO KK ; KAWASAKI STEEL CORP ; KOBE SEIKO SHO KK ; JFE STEEL CORP ; KAWASAKI SEITETSU KK

**Inventor(s):** (std): KATO AKIRA ; KAWAGUCHI YOSHIZUMI ; KIDA MASAO ; KIKUCHI KAZUHIRO ; MATSUMOTO JUNICHI ; MORISHITA SHIGERU ; NIIMOTO TAKESHI ; SHIBUSAWA SHINICHI ; SHIOASHI YASUHIRO ; TANAKA KUNIHIO

**Legal status (INPADOC)**

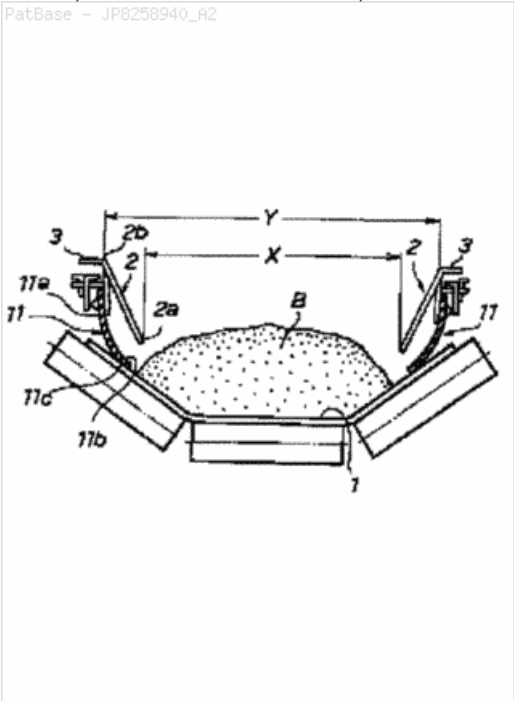
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| Patent       | Date recorded | Event group | Code | Event                                | Details |
|--------------|---------------|-------------|------|--------------------------------------|---------|
| JP2752579 B2 | 19980518      | LSGT        | +    | granted / extensions (spc, cpc, pte) |         |
| JP7277439 A2 | 19951024      | LSPB        | +    | published / reissued                 |         |

**Title:** SKIRT STRUCTURE FOR BELT CONVEYOR

**Abstract:** Source: JP8258940A **PURPOSE:** To provide the skirt structure for a belt conveyor, which can follow the vertical displacement of a belt, and concurrently can lengthen an maintenance interval. **CONSTITUTION:** Guide plates 2 which are formed along the longer direction of a conveyor belt 1, are provided while being inclined in a funnel shape to the center side of the conveyyor belt 1 at both right and left sides of a chute outlet section through which bulk material is supplied to the conveyor belt. And the upper end sections 11a of rubber-like elastic plates 11 formed along the longer direction of the conveyor belt 1, are mounted at the outsides of both the guide plates 2, and it is so constituted that the lower end sections 11b of both the rubber-like elastic plates 11 are made flexible to the center side of the conveyor belt 1, and the outer surfaces 11c of these lower end section 11b are brought into contact elastically with the surface of the conveyor belt 1.

**Classifications:**  
**International (IPC 8-9):** B65G15/08 B65G21/20 B65G69/18 (Advanced/Invention);  
B65G15/08 B65G21/20 B65G69/00 (Core/Invention)  
**International (IPC 1-7):** B65G15/08 B65G21/20 B65G69/18  
**CPC:** B65G21/2081  
**European:** B65G21/20D2B1



**Family:**

| Publication number | Publication date | Application number | Application date |
|--------------------|------------------|--------------------|------------------|
| JP8258940 A2       | 19961008         | JP19950059234      | 19950317         |

**Priority:**

JP19950059234 19950317

**Probable Assignee:** ISHIKAWAJIMA HARIMA HEAVY IND

**Assignee(s):** (std): IHI CORP ; ISHIKAWAJIMA HARIMA HEAVY IND

**Assignee(s):** ISHIKAWAJIMA HARIMA HEAVY IND CO LTD ; ISHIKAWAJIMA HARIMA HEAVY INDUSTRIES CO LTD

**Inventor(s):** (std): NOZAKI TAKASHI

**Legal status (INPADOC)**

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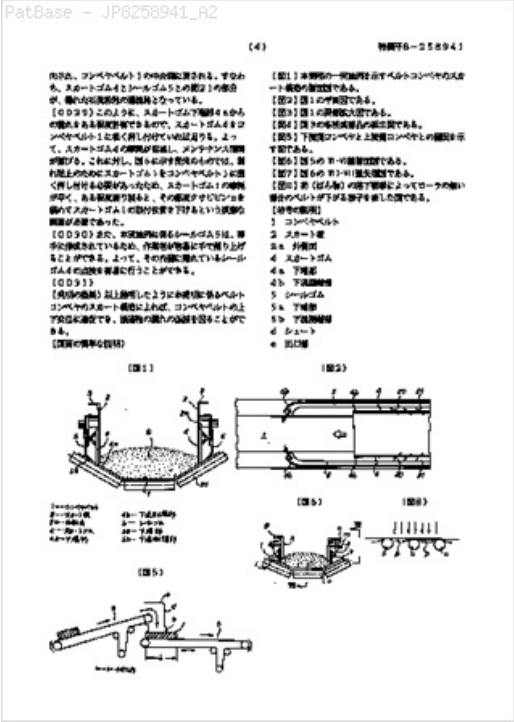
| Patent       | Date recorded | Event group | Code | Event                | Details |
|--------------|---------------|-------------|------|----------------------|---------|
| JP8258940 A2 | 19961008      | LSPB        | +    | published / reissued |         |

Title: SKIRT STRUCTURE FOR BELT CONVEYOR

**Abstract:** Source: JP8258941A PURPOSE: To provide the skirt structure for a belt conveyor, which can follow the vertical displacement of a belt, and reduce the leakage of material to be carried. CONSTITUTION: In the skirt structure for a belt conveyor skirt plates 2 formed along the longer direction of a conveyor belt 1 are provided for both right and left sides of a chute outlet section supplying bulk material to the conveyor belt, skirt rubbers 4 formed in a plate shape each, are mounted to the outer surfaces of both the skirt plates 2, and the lower ends 4a of both the skirt rubbers 4 are brought into contact with the surface of the conveyor belt 1. Seal rubbers 5 made thinner in thickness than the skirt rubbers 4, are arranged in such a way as to be dropped down outside in the width direction of the conveyor belt at both the skirt rubbers 4, and the lower end sections 5a of these seal rubbers 5 are bent to the center section side of the conveyor belt so as to be in contact with the surface of the conveyor belt 1 in a loosened condition.

**Classifications:**

**International (IPC 8-9):** B65G15/08 B65G21/20 B65G47/16 B65G69/18 (Advanced/Invention); B65G15/08 B65G21/20 B65G47/02 B65G69/00 (Core/Invention)  
**International (IPC 1-7):** B65G15/08 B65G21/20 B65G47/16 B65G69/18



**Family:**

| Publication number | Publication date | Application number | Application date |
|--------------------|------------------|--------------------|------------------|
| JP3389729 B2       | 20030324         | JP19950062988      | 19950322         |
| JP8258941 A2       | 19961008         | JP19950062988      | 19950322         |

**Priority:**

JP19950062988 19950322

**Probable Assignee:** ISHIKAWAJIMA HARIMA HEAVY IND

**Assignee(s):** (std): IHI CORP ; ISHIKAWAJIMA HARIMA HEAVY IND

**Assignee(s):** ISHIKAWAJIMA HARIMA HEAVY IND CO LTD ; ISHIKAWAJIMA HARIMA HEAVY INDUSTRIES CO LTD

**Inventor(s):** (std): YAMASHITA MASATERU

**Legal status (INPADOC)**

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| Patent       | Date recorded | Event group | Code  | Event                                                | Details                                           |
|--------------|---------------|-------------|-------|------------------------------------------------------|---------------------------------------------------|
| JP3389729 B2 | 20030324      | LSGT        | +     | granted / extensions (spc, cpc, pte)                 |                                                   |
| JP3389729 B2 | 20051222      | LSAS        | S111  | REQUEST FOR CHANGE OF OWNERSHIP OR PART OF OWNERSHIP | DESCRIPTION : JAPANESE INTERMEDIATE CODE: R313113 |
| JP3389729 B2 | 20060106      | LSAS        | R350  | WRITTEN NOTIFICATION OF REGISTRATION OF TRANSFER     | DESCRIPTION : JAPANESE INTERMEDIATE CODE: R350    |
| JP3389729 B2 | 20060117      | LSLE        | -LAPS | CANCELLATION BECAUSE OF NO PAYMENT OF ANNUAL FEES    |                                                   |
| JP8258941 A2 | 19961008      | LSPB        | +     | published / reissued                                 |                                                   |

**Title:** DUST RAISING PREVENTING DEVICE FOR CONVEYOR CONVEYING DEVICE

**Abstract:** Source: JP10329921A PROBLEM TO BE SOLVED: To prevent the raising of dust almost completely and prevent the deterioration of the work environment and the cansing of pollution by arranging a low-abrasion resin sheet-like body between carrier rollers along the trough angle of a conveyor belt, and fitting it to a fixed plate to press the conveyor belt to a skirt plate connected to the fixed plate via a skirt fitting plate. SOLUTION: A low-abrasion resin sheet 7 is arranged between carrier rollers on the lower face side of a conveyor belt 4 along of the conveyor belt 4. The low-abrasion resin sheet 7 is fitted to the lower face of the conveyor belt 4 via the fixed plate 9 of the skirt plate 3 of a conveyor main body to press the conveyor belt 4 to the nearly L-shaped skirt plate 3. The skirt plate 3 is fitted to the fixed plate 9 via a skirt fitting plate 10. The low-abrasion resin sheet 7 is fitted to the lower section of the fixed plate 9 via a hollow buffer body 8.

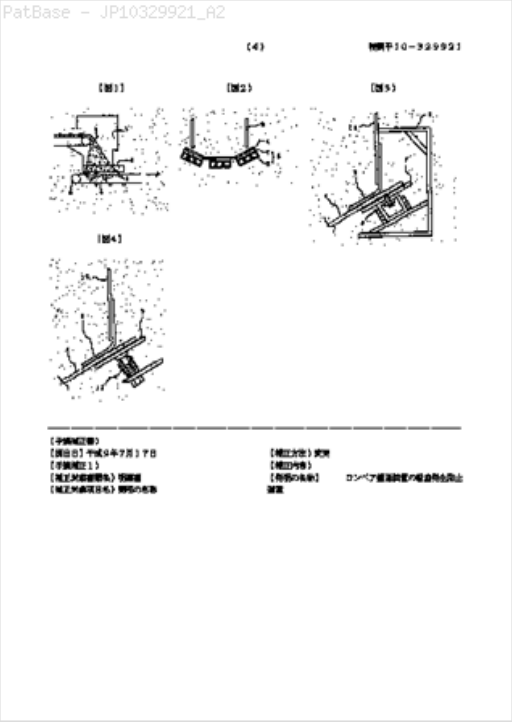
**Classifications:**

**International (IPC 8-9):** B65G15/08 B65G21/00 B65G21/20 B65G69/18 (Advanced/Invention); B65G21/00 (Advanced/Non-invention); B65G15/08 B65G21/00 B65G21/20 B65G69/00 (Core/Invention); B65G21/00 (Core/Non-invention)

**International (IPC 1-7):** B65G15/08 B65G21/00 B65G21/20 B65G69/18

**CPC:** B65G21/2081

**European:** B65G21/20D2B1



**Family:**

| Publication number | Publication date | Application number | Application date |
|--------------------|------------------|--------------------|------------------|
| JP10329921 A2      | 19981215         | JP19970157366      | 19970602         |
| JP3316419 B2       | 20020819         | JP19970157366      | 19970602         |

**Priority:**

JP19970157366 19970602

**Probable Assignee:** BANDO CHEMICAL IND

**Assignee(s):** (std): BANDO CHEMICAL IND

**Assignee(s):** BANDO CHEMICAL INDUSTRIES LTD ; BANDO CHEM IND LTD

**Inventor(s):** (std): ITO KENICHI

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| Patent        | Date recorded | Event group | Code  | Event                                             | Details |
|---------------|---------------|-------------|-------|---------------------------------------------------|---------|
| JP10329921 A2 | 19981215      | LSPB        | +     | published / reissued                              |         |
| JP3316419 B2  | 20020819      | LSGT        | +     | granted / extensions (spc, cpc, pte)              |         |
| JP3316419 B2  | 20080607      | LSLE        | -LAPS | CANCELLATION BECAUSE OF NO PAYMENT OF ANNUAL FEES |         |

**Title:** Clamping system for a sealing element on a conveyor system, and a method of maintaining a sealing element on a conveyor system

**Abstract:** Source: US2002175050A The combination of a conveying surface that is movable to advance material supported thereon, a wall projecting upwardly from the conveying surface to confine material on the conveying surface, a sealing element to block passage of material between the conveyor surface and wall, and a clamping system for the sealing element. The clamping system may consist of a) a locking assembly having a bearing portion that is mounted for movement relative to the wall between i) a mounting position and ii) a holding position, with the sealing element residing between the wall and the bearing portion with the locking element in the holding position, b) a fixing element on the wall, and c) a wedge assembly having a body that cooperates with the fixing element and that is movable slidably and guidingly relative to the locking assembly between first and second positions. The wedge assembly in the second position urges the bearing portion of the locking assembly toward the sealing element with a force that is greater than a force with which the wedge assembly urges the bearing portion of the locking assembly toward the sealing element with the wedge assembly in the first position.

**Classifications:**

**International (IPC 8-9):** B65G21/20 (Advanced/Invention);

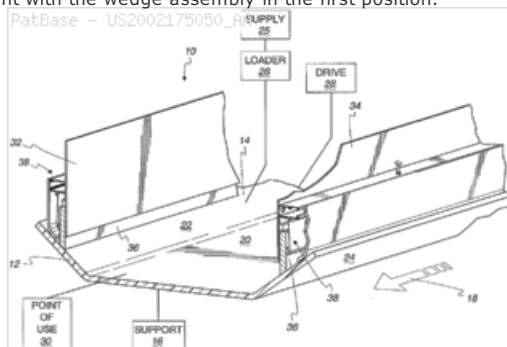
B65G21/20 (Core/Invention)

**International (IPC 1-7):** B65G21/20 B65G47/19

**CPC:** B65G21/2081

**European:** B65G21/20D2B1

**US:** 198/525 198/818 198/836.1



**Family:**

| Publication number | Publication date | Application number | Application date |
|--------------------|------------------|--------------------|------------------|
| US2002175050 AA    | 20021128         | US20010851305      | 20010508         |
| US6547062 BB       | 20030415         | US20010851305      | 20010508         |

**Priority:**

US20010851305 20010508

**Probable Assignee:**

ARGONICS INC

**Assignee(s):** (std):

ARGONICS INC ; WIGGINS DANIEL

**Inventor(s):** (std):

WIGGINS DANIEL

**Legal status (INPADOC)**

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| Patent          | Date recorded | Event group | Code  | Event                                | Details                                                                                                                                                                                                               |
|-----------------|---------------|-------------|-------|--------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| US2002175050 AA | 20021128      | LSPB        | +     | published / reissued                 |                                                                                                                                                                                                                       |
| US6547062 BB    | 20030415      | LSGT        | +     | granted / extensions (spc, cpc, pte) |                                                                                                                                                                                                                       |
| US6547062 BB    | 20030303      | LSAS        | AS    | ASSIGNMENT                           | OWNER NAME : ARGONICS, INC., MICHIGAN<br>DESCRIPTION : ASSIGNMENT OF ASSIGNORS INTEREST;<br>ASSIGNOR:WIGGINS, DANIEL;<br>REEL/FRAME:013800/0543<br>EFFECTIVE DATE : 20010420                                          |
| US6547062 BB    | 20050214      | LSAS        | AS    | ASSIGNMENT                           | OWNER NAME : ARGONICS, INC., MICHIGAN<br>DESCRIPTION : ASSIGNMENT OF ASSIGNORS INTEREST;<br>ASSIGNORS:WIGGINS, DANIEL G.; AIRAUDI, ROBERT J.; HENDERSON, ALAN J.; REEL/FRAME:016256/0263<br>EFFECTIVE DATE : 20041220 |
| US6547062 BB    | 20060808      | LSRE        | CC    | CERTIFICATE OF CORRECTION            |                                                                                                                                                                                                                       |
| US6547062 BB    | 20061016      | LSFE        | +FPAY | FEE PAYMENT                          | YEAR OF FEE PAYMENT : 4                                                                                                                                                                                               |
| US6547062 BB    | 20101015      | LSFE        | +FPAY | FEE PAYMENT                          | YEAR OF FEE PAYMENT : 8                                                                                                                                                                                               |
| US6547062 BB    | 20141015      | LSFE        | +FPAY | FEE PAYMENT                          | YEAR OF FEE PAYMENT : 12                                                                                                                                                                                              |

**Title:** Conveyor belt skirt assembly

**Abstract:** Source: US6575294B A conveyor belt skirt assembly adapted to be attached to a conveyor mechanism to retain conveyed material on a conveyor belt. The conveyor belt skirt assembly includes a mounting mechanism having first and second clamping members and a conveyor belt skirt adapted to be attached between the first and second clamping members. The conveyor belt skirt includes a relatively thin upper portion and a relatively thick lower portion. The upper portion of the skirt includes an offset wall forming a pocket adapted to receive the first clamping member.

**Classifications:**

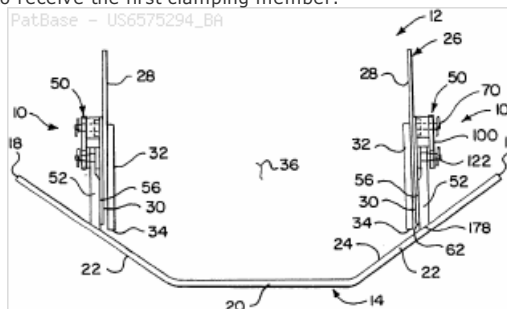
**International (IPC 8-9):** B65G21/20 (Advanced/Invention); B65G21/20 (Core/Invention)

**International (IPC 1-7):** B65G21/20

**CPC:** B65G21/2081

**European:** B65G21/20D2B1

**US:** 198/836.1 198/836.2 198/836.3 198/836.4



**Family:**

| Publication number | Publication date | Application number | Application date |
|--------------------|------------------|--------------------|------------------|
| US6575294 BA       | 20030610         | US20020193745      | 20020711         |

**Priority:**

US20020193745 20020711

**Probable Assignee:** MARTIN ENGINEERING CO

**Assignee(s):** (std): MARTIN ENG CO

**Assignee(s):** MARTIN ENGINEERING CO ; MARTIN ENGINEERING COMPANY

**Inventor(s):** (std): BRODY STEVEN E ; SWEARINGEN GARY D ; SWINDERMAN R TODD

**Legal status (INPADOC)**

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| Patent       | Date recorded | Event group | Code  | Event                                | Details                                                                                                                                                                                                                                 |
|--------------|---------------|-------------|-------|--------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| US6575294 BA | 20030610      | LSGT        | +     | granted / extensions (spc, cpc, pte) |                                                                                                                                                                                                                                         |
| US6575294 BA | 20020918      | LSAS        | AS    | ASSIGNMENT                           | OWNER NAME : MARTIN ENGINEERING COMPANY, ILLINOIS<br>DESCRIPTION : ASSIGNMENT OF ASSIGNORS INTEREST;<br>ASSIGNORS:SWINDERMAN, R. TODD;<br>SWEARINGEN, GARY D.; BRODY, STEVEN E.;<br>REEL/FRAME:013309/0342<br>EFFECTIVE DATE : 20020830 |
| US6575294 BA | 20061211      | LSFE        | +FPAY | FEE PAYMENT                          | YEAR OF FEE PAYMENT : 4                                                                                                                                                                                                                 |
| US6575294 BA | 20101210      | LSFE        | +FPAY | FEE PAYMENT                          | YEAR OF FEE PAYMENT : 8                                                                                                                                                                                                                 |
| US6575294 BA | 20141210      | LSFE        | +FPAY | FEE PAYMENT                          | YEAR OF FEE PAYMENT : 12                                                                                                                                                                                                                |

**Title:** DEVICE FOR PROTECTING SKIRT OF BELT CONVEYOR

**Abstract:** Source: KR20030046187A PURPOSE: A skirt protector of a belt conveyor is provided to minimize a deadlock time and to improve the productivity by preventing the early corrosion and the breakage of a skirt and a belt member under a chute. CONSTITUTION: An operating portion(10) has installing slots(122) to be penetrated through a vertical plate(121) under a chute and operating plates(11) to be assembled in the installing slots to be rotatable. The operating portion is rotated by materials to be dropped on a belt member(132). In a skirt portion(30), a wire(31) to be connected with the rear side of the operating plates is connected with a skirt operating bar(32). The center of the skirt operating bar is connected with a connecting bar(34) in the vertical plate. A supporting plate(36) assembling a skirt(39) is installed in the other side of the skirt operating plate. The skirt is contacted or separated from both sides of the belt member according to the drop of materials through the chute. Thereby, the drop of the materials is prevented to prevent the early corrosion and the breakage of the skirt and the belt member.

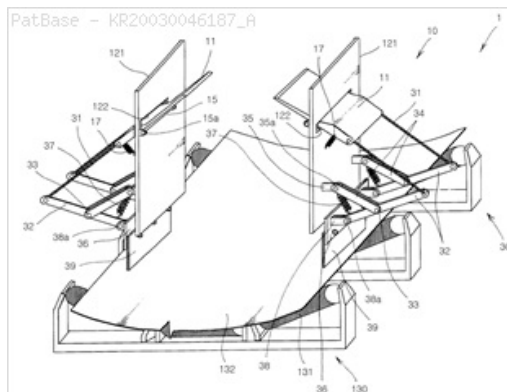
**Classifications:**

**International (IPC 8-9):** B65G21/20 (Advanced/Invention);

B65G21/20 (Advanced/Non-invention);

B65G21/20 (Core/Invention)

**International (IPC 1-7):** B65G21/20



**Family:**

| Publication number | Publication date | Application number | Application date |
|--------------------|------------------|--------------------|------------------|
| KR100843915 B1     | 20080704         | KR20010076646      | 20011205         |
| KR20030046187 A    | 20030612         | KR20010076646      | 20011205         |

**Priority:**

KR20010076646 20011205

**Probable Assignee:** POSCO

**Assignee(s):** (std): POHANG IRON AND STEEL CO ; POSCO

**Inventor(s):** (std): CHOI DONG HUI ; KIM TAE OK ; KWON SEUNG JEONG ; SHIN YEONG SU

**Legal status (INPADOC)**

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| Patent          | Date recorded | Event group | Code  | Event                                             | Details                                            |
|-----------------|---------------|-------------|-------|---------------------------------------------------|----------------------------------------------------|
| KR100843915 B1  | 20080704      | LSGT        | +     | granted / extensions (spc, cpc, pte)              |                                                    |
| KR100843915 B1  | 20061127      | LSSES       | A201  | REQUEST FOR EXAMINATION                           |                                                    |
| KR100843915 B1  | 20071206      | LSSES       | -E902 | NOTIFICATION OF REASON FOR REFUSAL                |                                                    |
| KR100843915 B1  | 20080530      | LSGT        | +E701 | DECISION TO GRANT OR REGISTRATION OF PATENT RIGHT |                                                    |
| KR100843915 B1  | 20080627      | LSGT        | +GRNT | WRITTEN DECISION TO GRANT                         |                                                    |
| KR100843915 B1  | 20130531      | LSFE        | FPAY  | ANNUAL FEE PAYMENT                                | PAYMENT DATE : 20130603<br>YEAR OF FEE PAYMENT : 6 |
| KR100843915 B1  | 20140626      | LSFE        | FPAY  | ANNUAL FEE PAYMENT                                | PAYMENT DATE : 20140627<br>YEAR OF FEE PAYMENT : 7 |
| KR100843915 B1  | 20150628      | LSLE        | -LAPS | LAPSE DUE TO UNPAID ANNUAL FEE                    |                                                    |
| KR20030046187 A | 20030612      | LSPB        | +     | published / reissued                              |                                                    |



## Legal status (INPADOC)

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| Patent          | Date recorded | Event group | Code  | Event                                                                                      | Details                                                                                                                                                  |
|-----------------|---------------|-------------|-------|--------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------|
| AT446242 E      | 20091115      | LSGT        | +     | granted / extensions (spc, cpc, pte)                                                       |                                                                                                                                                          |
| AT446242 E      | 20100415      | LSLE        | -RER  | CEASED AS TO PARAGRAPH 5 LIT. 3 LAW INTRODUCING PATENT TREATIES                            |                                                                                                                                                          |
| AU2003262226 AA | 20050303      | LSPB        | +     | published / reissued                                                                       |                                                                                                                                                          |
| AU2003262226 AA | 20100401      | LSGT        | +FGA  | LETTERS PATENT SEALED OR GRANTED (STANDARD PATENT)                                         |                                                                                                                                                          |
| AU2003262226 BB | 20091119      | LSGT        | +     | granted / extensions (spc, cpc, pte)                                                       |                                                                                                                                                          |
| AU2003302662 AA | 20040623      | LSPB        | +     | published / reissued                                                                       |                                                                                                                                                          |
| AU2003302662 AA | 20050922      | LSLE        | -MK6  | APPLICATION LAPSED SECTION 142(2)(F)/REG. 8.3(3) - PCT APPLIC. NOT ENTERING NATIONAL PHASE |                                                                                                                                                          |
| CA2446066 AA    | 20050422      | LSPB        | +     | published / reissued                                                                       |                                                                                                                                                          |
| CA2446066 AA    | 20080911      | LSES        | +EEER | EXAMINATION REQUEST                                                                        |                                                                                                                                                          |
| CA2446066 C     | 20111115      | LSGT        | +     | granted / extensions (spc, cpc, pte)                                                       |                                                                                                                                                          |
| CN1745015 A     | 20060308      | LSPB        | +     | published / reissued                                                                       |                                                                                                                                                          |
| CN1745015 A     | 20060308      | LSPB        | +C06  | PUBLICATION                                                                                |                                                                                                                                                          |
| CN1745015 A     | 20070103      | LSRE        | COR   | CHANGE OF BIBLIOGRAPHIC DATA                                                               | DESCRIPTION : CORRECT: [33] PRIORITY ^ FIRST NATIONAL VARIETY OF PRIORITY ^ SECOND NATIONAL VARIETY OF PRIORITY; FROM: ^[33]JP^[33]JP TO: ^[33]GB^[33]GB |
| CN1745015 A     | 20110105      | LSDW        | -C20  | PATENT RIGHT OR UTILITY MODEL DEEMED TO BE ABANDONED OR IS ABANDONED                       |                                                                                                                                                          |
| CN1745015 A     | 20130628      | LSWD        | REG   | REFERENCE TO A NATIONAL CODE                                                               | REF COUNTRY CODE : HK<br>REF LEGAL EVENT CODE : WD<br>REF DOCUMENT NUMBER : 1089418<br>COUNTRY OF REF DOCUMENT : HK                                      |
| DE10356013 A1   | 20050331      | LSPB        | +     | published / reissued                                                                       |                                                                                                                                                          |
| DE10356013 A1   | 20090827      | LSES        | +8110 | REQUEST FOR EXAMINATION PARAGRAPH 44                                                       |                                                                                                                                                          |
| DE10356013 A1   | 20130919      | LSDW        | -R119 | APPLICATION DEEMED WITHDRAWN, OR IP RIGHT LAPSED, DUE TO NON-PAYMENT OF RENEWAL FEE        | EFFECTIVE DATE : 20130601                                                                                                                                |
| DE60329784 D1   | 20101111      | LSGT        | +8364 | NO OPPOSITION DURING TERM OF OPPOSITION                                                    |                                                                                                                                                          |
| EP1578660 A1    | 20050928      | LSPB        | +     | published / reissued                                                                       |                                                                                                                                                          |
| EP1578660 A1    | 20050928      | LSES        | +17P  | REQUEST FOR EXAMINATION FILED                                                              | EFFECTIVE DATE : 20050629                                                                                                                                |
| EP1578660 A1    | 20060830      | LSES        | +17Q  | FIRST EXAMINATION REPORT                                                                   | EFFECTIVE DATE : 20060731                                                                                                                                |
| EP1578660 A1    | 20091021      | LSGT        | REG   | REFERENCE TO A NATIONAL CODE                                                               | REF COUNTRY CODE : GB<br>REF LEGAL EVENT CODE : FG4D                                                                                                     |
| EP1578660 A1    | 20091030      | LSNP        | REG   | REFERENCE TO A NATIONAL CODE                                                               | REF COUNTRY CODE : CH<br>REF LEGAL EVENT CODE : EP                                                                                                       |
| EP1578660 A1    | 20091111      | LSGT        | REG   | REFERENCE TO A NATIONAL CODE                                                               | REF COUNTRY CODE : IE<br>REF LEGAL EVENT CODE : FG4D                                                                                                     |
| EP1578660 A1    | 20100115      | LSGT        | REG   | REFERENCE TO A                                                                             | REF COUNTRY CODE : HK                                                                                                                                    |

|              |          |      |       | NATIONAL CODE                                                                                                              | REF LEGAL EVENT CODE : GR<br>REF DOCUMENT NUMBER :<br>1083088<br>COUNTRY OF REF DOCUMENT :<br>HK                                                                                                          |
|--------------|----------|------|-------|----------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| EP1578660 A1 | 20100129 | LSFE | +PGFP | POSTGRANT: ANNUAL<br>FEES PAID TO<br>NATIONAL OFFICE                                                                       | REF COUNTRY CODE : FI<br>PAYMENT DATE : 20091228<br>YEAR OF FEE PAYMENT : 07                                                                                                                              |
| EP1578660 A1 | 20100401 | LSLE | -NLV1 | NL: LAPSED OR<br>ANNULLED DUE TO<br>FAILURE TO FULFILL<br>THE REQUIREMENTS<br>OF ART. 29P AND<br>29M OF THE<br>PATENTS ACT |                                                                                                                                                                                                           |
| EP1578660 A1 | 20100430 | LSLE | -PG25 | LAPSED IN A<br>CONTRACTING<br>STATE ANNOUNCED<br>VIA POSTGRANT<br>INFORM. FROM NAT.<br>OFFICE TO EPO                       | REF COUNTRY CODE : PT<br>DESCRIPTION : LAPSE BECAUSE<br>OF FAILURE TO SUBMIT A<br>TRANSLATION OF THE<br>DESCRIPTION OR TO PAY THE<br>FEE WITHIN THE PRESCRIBED<br>TIME-LIMIT<br>EFFECTIVE DATE : 20100222 |
| EP1578660 A1 | 20100430 | LSLE | -PG25 | LAPSED IN A<br>CONTRACTING<br>STATE ANNOUNCED<br>VIA POSTGRANT<br>INFORM. FROM NAT.<br>OFFICE TO EPO                       | REF COUNTRY CODE : SE<br>DESCRIPTION : LAPSE BECAUSE<br>OF FAILURE TO SUBMIT A<br>TRANSLATION OF THE<br>DESCRIPTION OR TO PAY THE<br>FEE WITHIN THE PRESCRIBED<br>TIME-LIMIT<br>EFFECTIVE DATE : 20091021 |
| EP1578660 A1 | 20100430 | LSFE | +PGFP | POSTGRANT: ANNUAL<br>FEES PAID TO<br>NATIONAL OFFICE                                                                       | REF COUNTRY CODE : ES<br>PAYMENT DATE : 20100125<br>YEAR OF FEE PAYMENT : 07                                                                                                                              |
| EP1578660 A1 | 20100430 | LSFE | +PGFP | POSTGRANT: ANNUAL<br>FEES PAID TO<br>NATIONAL OFFICE                                                                       | REF COUNTRY CODE : FR<br>PAYMENT DATE : 20100108<br>YEAR OF FEE PAYMENT : 07                                                                                                                              |
| EP1578660 A1 | 20100531 | LSLE | -PG25 | LAPSED IN A<br>CONTRACTING<br>STATE ANNOUNCED<br>VIA POSTGRANT<br>INFORM. FROM NAT.<br>OFFICE TO EPO                       | REF COUNTRY CODE : SI<br>DESCRIPTION : LAPSE BECAUSE<br>OF FAILURE TO SUBMIT A<br>TRANSLATION OF THE<br>DESCRIPTION OR TO PAY THE<br>FEE WITHIN THE PRESCRIBED<br>TIME-LIMIT<br>EFFECTIVE DATE : 20091021 |
| EP1578660 A1 | 20100630 | LSLE | -PG25 | LAPSED IN A<br>CONTRACTING<br>STATE ANNOUNCED<br>VIA POSTGRANT<br>INFORM. FROM NAT.<br>OFFICE TO EPO                       | REF COUNTRY CODE : AT<br>DESCRIPTION : LAPSE BECAUSE<br>OF FAILURE TO SUBMIT A<br>TRANSLATION OF THE<br>DESCRIPTION OR TO PAY THE<br>FEE WITHIN THE PRESCRIBED<br>TIME-LIMIT<br>EFFECTIVE DATE : 20091021 |
| EP1578660 A1 | 20100630 | LSLE | -PG25 | LAPSED IN A<br>CONTRACTING<br>STATE ANNOUNCED<br>VIA POSTGRANT<br>INFORM. FROM NAT.<br>OFFICE TO EPO                       | REF COUNTRY CODE : BE<br>DESCRIPTION : LAPSE BECAUSE<br>OF FAILURE TO SUBMIT A<br>TRANSLATION OF THE<br>DESCRIPTION OR TO PAY THE<br>FEE WITHIN THE PRESCRIBED<br>TIME-LIMIT<br>EFFECTIVE DATE : 20091021 |
| EP1578660 A1 | 20100630 | LSFE | +PGFP | POSTGRANT: ANNUAL<br>FEES PAID TO<br>NATIONAL OFFICE                                                                       | REF COUNTRY CODE : DE<br>PAYMENT DATE : 20100112<br>YEAR OF FEE PAYMENT : 07                                                                                                                              |
| EP1578660 A1 | 20100630 | LSFE | +PGFP | POSTGRANT: ANNUAL<br>FEES PAID TO<br>NATIONAL OFFICE                                                                       | REF COUNTRY CODE : GB<br>PAYMENT DATE : 20100107<br>YEAR OF FEE PAYMENT : 07                                                                                                                              |
| EP1578660 A1 | 20100730 | LSLE | -PG25 | LAPSED IN A<br>CONTRACTING<br>STATE ANNOUNCED<br>VIA POSTGRANT<br>INFORM. FROM NAT.<br>OFFICE TO EPO                       | REF COUNTRY CODE : RO<br>DESCRIPTION : LAPSE BECAUSE<br>OF FAILURE TO SUBMIT A<br>TRANSLATION OF THE<br>DESCRIPTION OR TO PAY THE<br>FEE WITHIN THE PRESCRIBED<br>TIME-LIMIT<br>EFFECTIVE DATE : 20091021 |
| EP1578660 A1 | 20100730 | LSLE | -PG25 | LAPSED IN A<br>CONTRACTING<br>STATE ANNOUNCED<br>VIA POSTGRANT<br>INFORM. FROM NAT.<br>OFFICE TO EPO                       | REF COUNTRY CODE : BG<br>DESCRIPTION : LAPSE BECAUSE<br>OF FAILURE TO SUBMIT A<br>TRANSLATION OF THE<br>DESCRIPTION OR TO PAY THE<br>FEE WITHIN THE PRESCRIBED<br>TIME-LIMIT<br>EFFECTIVE DATE : 20100121 |

|              |          |      |       |                                                                                       |                                                                                                                                                                                            |
|--------------|----------|------|-------|---------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| EP1578660 A1 | 20100730 | LSLE | -PG25 | LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO | REF COUNTRY CODE : DK<br>DESCRIPTION : LAPSE BECAUSE OF FAILURE TO SUBMIT A TRANSLATION OF THE DESCRIPTION OR TO PAY THE FEE WITHIN THE PRESCRIBED TIME-LIMIT<br>EFFECTIVE DATE : 20091021 |
| EP1578660 A1 | 20100730 | LSLE | -PG25 | LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO | REF COUNTRY CODE : EE<br>DESCRIPTION : LAPSE BECAUSE OF FAILURE TO SUBMIT A TRANSLATION OF THE DESCRIPTION OR TO PAY THE FEE WITHIN THE PRESCRIBED TIME-LIMIT<br>EFFECTIVE DATE : 20091021 |
| EP1578660 A1 | 20100730 | LSLE | -PG25 | LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO | REF COUNTRY CODE : MC<br>DESCRIPTION : LAPSE BECAUSE OF NON-PAYMENT OF DUE FEES<br>EFFECTIVE DATE : 20100701                                                                               |
| EP1578660 A1 | 20100730 | LSLE | REG   | REFERENCE TO A NATIONAL CODE                                                          | REF COUNTRY CODE : CH<br>REF LEGAL EVENT CODE : PL                                                                                                                                         |
| EP1578660 A1 | 20100831 | LSLE | -PG25 | LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO | REF COUNTRY CODE : SK<br>DESCRIPTION : LAPSE BECAUSE OF FAILURE TO SUBMIT A TRANSLATION OF THE DESCRIPTION OR TO PAY THE FEE WITHIN THE PRESCRIBED TIME-LIMIT<br>EFFECTIVE DATE : 20091021 |
| EP1578660 A1 | 20100831 | LSLE | -PG25 | LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO | REF COUNTRY CODE : CZ<br>DESCRIPTION : LAPSE BECAUSE OF FAILURE TO SUBMIT A TRANSLATION OF THE DESCRIPTION OR TO PAY THE FEE WITHIN THE PRESCRIBED TIME-LIMIT<br>EFFECTIVE DATE : 20091021 |
| EP1578660 A1 | 20100831 | LSFE | +PGFP | POSTGRANT: ANNUAL FEES PAID TO NATIONAL OFFICE                                        | REF COUNTRY CODE : IT<br>PAYMENT DATE : 20091230<br>YEAR OF FEE PAYMENT : 07                                                                                                               |
| EP1578660 A1 | 20100929 | LSGT | +26N  | NO OPPOSITION FILED                                                                   | EFFECTIVE DATE : 20100722                                                                                                                                                                  |
| EP1578660 A1 | 20101029 | LSLE | -PG25 | LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO | REF COUNTRY CODE : IE<br>DESCRIPTION : LAPSE BECAUSE OF NON-PAYMENT OF DUE FEES<br>EFFECTIVE DATE : 20091201                                                                               |
| EP1578660 A1 | 20101130 | LSLE | -PG25 | LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO | REF COUNTRY CODE : CH<br>DESCRIPTION : LAPSE BECAUSE OF NON-PAYMENT OF DUE FEES<br>EFFECTIVE DATE : 20091231                                                                               |
| EP1578660 A1 | 20101130 | LSLE | -PG25 | LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO | REF COUNTRY CODE : GR<br>DESCRIPTION : LAPSE BECAUSE OF FAILURE TO SUBMIT A TRANSLATION OF THE DESCRIPTION OR TO PAY THE FEE WITHIN THE PRESCRIBED TIME-LIMIT<br>EFFECTIVE DATE : 20100122 |
| EP1578660 A1 | 20101130 | LSLE | -PG25 | LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO | REF COUNTRY CODE : LI<br>DESCRIPTION : LAPSE BECAUSE OF NON-PAYMENT OF DUE FEES<br>EFFECTIVE DATE : 20091231                                                                               |
| EP1578660 A1 | 20110429 | LSLE | -PG25 | LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO | REF COUNTRY CODE : LU<br>DESCRIPTION : LAPSE BECAUSE OF NON-PAYMENT OF DUE FEES<br>EFFECTIVE DATE : 20091201                                                                               |
| EP1578660 A1 | 20110729 | LSLE | -PG25 | LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO | REF COUNTRY CODE : HU<br>DESCRIPTION : LAPSE BECAUSE OF FAILURE TO SUBMIT A TRANSLATION OF THE DESCRIPTION OR TO PAY THE FEE WITHIN THE PRESCRIBED TIME-LIMIT<br>EFFECTIVE DATE : 20100422 |
| EP1578660 A1 | 20110824 | LSLE | -GBPC | GB: EUROPEAN                                                                          | EFFECTIVE DATE : 20101201                                                                                                                                                                  |

|              |          |      |       |                                                                                                      |                                                                                                                                                                                                           |
|--------------|----------|------|-------|------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|              |          |      |       | PATENT CEASED<br>THROUGH NON-<br>PAYMENT OF<br>RENEWAL FEE                                           |                                                                                                                                                                                                           |
| EP1578660 A1 | 20110831 | LSLE | -PG25 | LAPSED IN A<br>CONTRACTING<br>STATE ANNOUNCED<br>VIA POSTGRANT<br>INFORM. FROM NAT.<br>OFFICE TO EPO | REF COUNTRY CODE : FI<br>DESCRIPTION : LAPSE BECAUSE<br>OF NON-PAYMENT OF DUE FEES<br>EFFECTIVE DATE : 20101201                                                                                           |
| EP1578660 A1 | 20110909 | LSLE | REG   | REFERENCE TO A<br>NATIONAL CODE                                                                      | REF COUNTRY CODE : FR<br>REF LEGAL EVENT CODE : ST<br>EFFECTIVE DATE : 20110831                                                                                                                           |
| EP1578660 A1 | 20110930 | LSLE | -PG25 | LAPSED IN A<br>CONTRACTING<br>STATE ANNOUNCED<br>VIA POSTGRANT<br>INFORM. FROM NAT.<br>OFFICE TO EPO | REF COUNTRY CODE : TR<br>DESCRIPTION : LAPSE BECAUSE<br>OF FAILURE TO SUBMIT A<br>TRANSLATION OF THE<br>DESCRIPTION OR TO PAY THE<br>FEE WITHIN THE PRESCRIBED<br>TIME-LIMIT<br>EFFECTIVE DATE : 20091021 |
| EP1578660 A1 | 20111031 | LSLE | -PG25 | LAPSED IN A<br>CONTRACTING<br>STATE ANNOUNCED<br>VIA POSTGRANT<br>INFORM. FROM NAT.<br>OFFICE TO EPO | REF COUNTRY CODE : FR<br>DESCRIPTION : LAPSE BECAUSE<br>OF NON-PAYMENT OF DUE FEES<br>EFFECTIVE DATE : 20110103                                                                                           |
| EP1578660 A1 | 20111031 | LSLE | -PG25 | LAPSED IN A<br>CONTRACTING<br>STATE ANNOUNCED<br>VIA POSTGRANT<br>INFORM. FROM NAT.<br>OFFICE TO EPO | REF COUNTRY CODE : CY<br>DESCRIPTION : LAPSE BECAUSE<br>OF FAILURE TO SUBMIT A<br>TRANSLATION OF THE<br>DESCRIPTION OR TO PAY THE<br>FEE WITHIN THE PRESCRIBED<br>TIME-LIMIT<br>EFFECTIVE DATE : 20091021 |
| EP1578660 A1 | 20111117 | LSDW | REG   | REFERENCE TO A<br>NATIONAL CODE                                                                      | REF COUNTRY CODE : DE<br>REF LEGAL EVENT CODE : R119<br>REF DOCUMENT NUMBER :<br>60329784<br>COUNTRY OF REF DOCUMENT :<br>DE<br>EFFECTIVE DATE : 20110701                                                 |
| EP1578660 A1 | 20111130 | LSLE | -PG25 | LAPSED IN A<br>CONTRACTING<br>STATE ANNOUNCED<br>VIA POSTGRANT<br>INFORM. FROM NAT.<br>OFFICE TO EPO | REF COUNTRY CODE : GB<br>DESCRIPTION : LAPSE BECAUSE<br>OF NON-PAYMENT OF DUE FEES<br>EFFECTIVE DATE : 20101201                                                                                           |
| EP1578660 A1 | 20111130 | LSLE | -PG25 | LAPSED IN A<br>CONTRACTING<br>STATE ANNOUNCED<br>VIA POSTGRANT<br>INFORM. FROM NAT.<br>OFFICE TO EPO | REF COUNTRY CODE : DE<br>DESCRIPTION : LAPSE BECAUSE<br>OF NON-PAYMENT OF DUE FEES<br>EFFECTIVE DATE : 20110701                                                                                           |
| EP1578660 A1 | 20111230 | LSLE | -PG25 | LAPSED IN A<br>CONTRACTING<br>STATE ANNOUNCED<br>VIA POSTGRANT<br>INFORM. FROM NAT.<br>OFFICE TO EPO | REF COUNTRY CODE : IT<br>DESCRIPTION : LAPSE BECAUSE<br>OF NON-PAYMENT OF DUE FEES<br>EFFECTIVE DATE : 20101201                                                                                           |
| EP1578660 A1 | 20120928 | LSLE | -PG25 | LAPSED IN A<br>CONTRACTING<br>STATE ANNOUNCED<br>VIA POSTGRANT<br>INFORM. FROM NAT.<br>OFFICE TO EPO | REF COUNTRY CODE : NL<br>DESCRIPTION : LAPSE BECAUSE<br>OF FAILURE TO SUBMIT A<br>TRANSLATION OF THE<br>DESCRIPTION OR TO PAY THE<br>FEE WITHIN THE PRESCRIBED<br>TIME-LIMIT<br>EFFECTIVE DATE : 20091021 |
| EP1578660 A1 | 20131129 | LSLE | -PG25 | LAPSED IN A<br>CONTRACTING<br>STATE ANNOUNCED<br>VIA POSTGRANT<br>INFORM. FROM NAT.<br>OFFICE TO EPO | REF COUNTRY CODE : ES<br>DESCRIPTION : THE PATENT<br>HAS BEEN ANNULLED BY A<br>DECISION OF A NATIONAL<br>AUTHORITY<br>EFFECTIVE DATE : 20100201                                                           |
| EP1578660 B1 | 20091021 | LSGT | +     | granted / extensions<br>(spc, cpc, pte)                                                              |                                                                                                                                                                                                           |
| GB2395689 A1 | 20040602 | LSPB | +     | published / reissued                                                                                 |                                                                                                                                                                                                           |
| GB2395689 A1 | 20110727 | LSLE | -PCNP | PATENT CEASED<br>THROUGH NON-<br>PAYMENT OF<br>RENEWAL FEE                                           | EFFECTIVE DATE : 20101130                                                                                                                                                                                 |
| GB2395689 B2 | 20060531 | LSGT | +     | granted / extensions<br>(spc, cpc, pte)                                                              |                                                                                                                                                                                                           |
| GB2395690 A1 | 20040602 | LSPB | +     | published / reissued                                                                                 |                                                                                                                                                                                                           |
| GB2395690 A1 | 20110727 | LSLE | -PCNP | PATENT CEASED                                                                                        | EFFECTIVE DATE : 20101130                                                                                                                                                                                 |

|                 |          |       |       |                                                                                  |                                                                                                                                                                             |  |
|-----------------|----------|-------|-------|----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|
|                 |          |       |       |                                                                                  | THROUGH NON-PAYMENT OF RENEWAL FEE                                                                                                                                          |  |
| GB2395690 A1    | 20140108 | LSRV  | S73   | REVOCATION ON COMPTROLLER'S INITIATIVE (SECTION 73/PATENTS ACT 1977)             | DESCRIPTION : PATENT REVOKED; PATENT REVOKED UNDER SECTION 73(2) ON 13 DECEMBER 2013                                                                                        |  |
| GB2395690 B2    | 20060405 | LSGT  | +     | granted / extensions (spc, cpc, pte)                                             |                                                                                                                                                                             |  |
| GB2404907 A1    | 20050216 | LSPB  | +     | published / reissued                                                             |                                                                                                                                                                             |  |
| GB2404907 A1    | 20130828 | LSLE  | -PCNP | PATENT CEASED THROUGH NON-PAYMENT OF RENEWAL FEE                                 | EFFECTIVE DATE : 20121203                                                                                                                                                   |  |
| GB2404907 B2    | 20061220 | LSGT  | +     | granted / extensions (spc, cpc, pte)                                             |                                                                                                                                                                             |  |
| HK1083088 A1    | 20100115 | LSGT  | +     | granted / extensions (spc, cpc, pte)                                             |                                                                                                                                                                             |  |
| HK1083088 A1    | 20140627 | LSLE  | -PC   | PATENT CEASED (I.E. PATENT HAS LAPSED DUE TO THE FAILURE TO PAY THE RENEWAL FEE) | EFFECTIVE DATE : 20131201                                                                                                                                                   |  |
| HK1083088 A3    | 20060623 | LSPB  | +     | published / reissued                                                             |                                                                                                                                                                             |  |
| HK1089418 A3    | 20061201 | LSPB  | +     | published / reissued                                                             |                                                                                                                                                                             |  |
| JP2006507984 T2 | 20060309 | LSPB  | +     | published / reissued                                                             |                                                                                                                                                                             |  |
| JP2006507984 T2 | 20061117 | LSSES | +A621 | WRITTEN REQUEST FOR APPLICATION EXAMINATION                                      | DESCRIPTION : JAPANESE INTERMEDIATE CODE: A621<br>EFFECTIVE DATE : 20061116                                                                                                 |  |
| JP2006507984 T2 | 20090521 | LSSES | -A131 | NOTIFICATION OF REASONS FOR REFUSAL                                              | DESCRIPTION : JAPANESE INTERMEDIATE CODE: A131<br>EFFECTIVE DATE : 20090520                                                                                                 |  |
| JP2006507984 T2 | 20090821 | LSRE  | A521  | WRITTEN AMENDMENT                                                                | DESCRIPTION : JAPANESE INTERMEDIATE CODE: A523<br>EFFECTIVE DATE : 20090820                                                                                                 |  |
| JP2006507984 T2 | 20100401 | LSSES | -A131 | NOTIFICATION OF REASONS FOR REFUSAL                                              | DESCRIPTION : JAPANESE INTERMEDIATE CODE: A131<br>EFFECTIVE DATE : 20100331                                                                                                 |  |
| JP2006507984 T2 | 20100401 | LSSES | -A131 | NOTIFICATION OF REASONS FOR REFUSAL                                              | DESCRIPTION : JAPANESE INTERMEDIATE CODE: A131<br>EFFECTIVE DATE : 20100331                                                                                                 |  |
| JP2006507984 T2 | 20100930 | LSRV  | -A02  | DECISION OF REFUSAL                                                              | DESCRIPTION : JAPANESE INTERMEDIATE CODE: A02<br>EFFECTIVE DATE : 20100929                                                                                                  |  |
| KR20050084055 A | 20050826 | LSPB  | +     | published / reissued                                                             |                                                                                                                                                                             |  |
| KR20050084055 A | 20081201 | LSSES | A201  | REQUEST FOR EXAMINATION                                                          |                                                                                                                                                                             |  |
| KR20050084055 A | 20101127 | LSSES | -E902 | NOTIFICATION OF REASON FOR REFUSAL                                               |                                                                                                                                                                             |  |
| KR20050084055 A | 20110208 | LSRV  | -E601 | DECISION TO REFUSE APPLICATION                                                   |                                                                                                                                                                             |  |
| NO20053198 A    | 20050630 | LSPB  | +     | published / reissued                                                             |                                                                                                                                                                             |  |
| NO20053198 A    | 20110725 | LSRV  | -FC2A | WITHDRAWAL, REJECTION OR DISMISSAL OF LAID OPEN PATENT APPLICATION               |                                                                                                                                                                             |  |
| US2004031666 AA | 20040219 | LSPB  | +     | published / reissued                                                             |                                                                                                                                                                             |  |
| US2006162279 AA | 20060727 | LSPB  | +     | published / reissued                                                             |                                                                                                                                                                             |  |
| US2006162279 AA | 20050816 | LSAS  | AS    | ASSIGNMENT                                                                       | OWNER NAME : DET NORSKE VERITAS, NORWAY<br>DESCRIPTION : ASSIGNMENT OF ASSIGNORS INTEREST;<br>ASSIGNOR:BERGAN, PAAL;<br>REEL/FRAME:017445/0766<br>EFFECTIVE DATE : 20050712 |  |
| US2006162279 AA | 20060117 | LSAS  | AS    | ASSIGNMENT                                                                       | OWNER NAME : DET NORSKE VERITAS, NORWAY<br>DESCRIPTION : ASSIGNMENT OF ASSIGNORS INTEREST;<br>ASSIGNOR:BERGAN, PAAL;                                                        |  |

|               |          |      |       |                                                         |                                                                                                                                                                                                         |
|---------------|----------|------|-------|---------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| US6763935 BB  | 20040720 | LSGT | +     | granted / extensions<br>(spc, cpc, pte)                 |                                                                                                                                                                                                         |
| US6763935 BB  | 20051115 | LSRE | CC    | CERTIFICATE OF<br>CORRECTION                            |                                                                                                                                                                                                         |
| US6763935 BB  | 20070320 | LSAS | AS    | ASSIGNMENT                                              | OWNER NAME : NELSON<br>WILLIAMS LININGS, INC.,<br>MINNESOTA<br>DESCRIPTION : ASSIGNMENT<br>OF ASSIGNORS INTEREST;<br>ASSIGNOR:OSTMAN, ARTHUR<br>C.; REEL/FRAME:019047/0145<br>EFFECTIVE DATE : 20020910 |
| US6763935 BB  | 20071112 | LSFE | +FPAY | FEE PAYMENT                                             | YEAR OF FEE PAYMENT : 4                                                                                                                                                                                 |
| US6763935 BB  | 20100820 | LSAS | AS    | ASSIGNMENT                                              | OWNER NAME : NELSON<br>WILLIAMS LININGS, INC.,<br>MINNESOTA<br>DESCRIPTION : ASSIGNMENT<br>OF ASSIGNORS INTEREST;<br>ASSIGNOR:OSTMAN, ARTHUR<br>C.; REEL/FRAME:024850/0960<br>EFFECTIVE DATE : 20100817 |
| US6763935 BB  | 20110817 | LSFE | +FPAY | FEE PAYMENT                                             | YEAR OF FEE PAYMENT : 8                                                                                                                                                                                 |
| US6763935 BB  | 20151002 | LSFE | +FPAY | FEE PAYMENT                                             | YEAR OF FEE PAYMENT : 12                                                                                                                                                                                |
| WO04050468 A1 | 20040617 | LSPB | +     | published / reissued                                    |                                                                                                                                                                                                         |
| WO04050468 A1 | 20050527 | LSNP | ENP   | ENTRY INTO THE<br>NATIONAL PHASE<br>IN:                 | REF DOCUMENT NUMBER :<br>2006162279<br>COUNTRY OF REF DOCUMENT :<br>US<br>KIND CODE OF REF DOCUMENT<br>: A1                                                                                             |
| WO04050468 A1 | 20050527 | LSNP | +WWE  | WIPO<br>INFORMATION:<br>ENTRY INTO<br>NATIONAL PHASE    | REF DOCUMENT NUMBER :<br>10536864<br>COUNTRY OF REF DOCUMENT :<br>US                                                                                                                                    |
| WO04050468 A1 | 20050530 | LSNP | +WWE  | WIPO<br>INFORMATION:<br>ENTRY INTO<br>NATIONAL PHASE    | REF DOCUMENT NUMBER :<br>2004556997<br>COUNTRY OF REF DOCUMENT :<br>JP                                                                                                                                  |
| WO04050468 A1 | 20050530 | LSNP | +WWE  | WIPO<br>INFORMATION:<br>ENTRY INTO<br>NATIONAL PHASE    | REF DOCUMENT NUMBER :<br>1020057009773<br>COUNTRY OF REF DOCUMENT :<br>KR                                                                                                                               |
| WO04050468 A1 | 20050629 | LSNP | +WWE  | WIPO<br>INFORMATION:<br>ENTRY INTO<br>NATIONAL PHASE    | REF DOCUMENT NUMBER :<br>2003812393<br>COUNTRY OF REF DOCUMENT :<br>EP                                                                                                                                  |
| WO04050468 A1 | 20050729 | LSNP | +WWE  | WIPO<br>INFORMATION:<br>ENTRY INTO<br>NATIONAL PHASE    | REF DOCUMENT NUMBER :<br>20038A93802<br>COUNTRY OF REF DOCUMENT :<br>CN                                                                                                                                 |
| WO04050468 A1 | 20050826 | LSPB | +WWP  | WIPO<br>INFORMATION:<br>PUBLISHED IN<br>NATIONAL OFFICE | REF DOCUMENT NUMBER :<br>1020057009773<br>COUNTRY OF REF DOCUMENT :<br>KR                                                                                                                               |
| WO04050468 A1 | 20050928 | LSPB | +WWP  | WIPO<br>INFORMATION:<br>PUBLISHED IN<br>NATIONAL OFFICE | REF DOCUMENT NUMBER :<br>2003812393<br>COUNTRY OF REF DOCUMENT :<br>EP                                                                                                                                  |
| WO04050468 A1 | 20060727 | LSPB | +WWP  | WIPO<br>INFORMATION:<br>PUBLISHED IN<br>NATIONAL OFFICE | REF DOCUMENT NUMBER :<br>10536864<br>COUNTRY OF REF DOCUMENT :<br>US                                                                                                                                    |

**Title:** SKIRT STRUCTURE OF BELT CONVEYOR

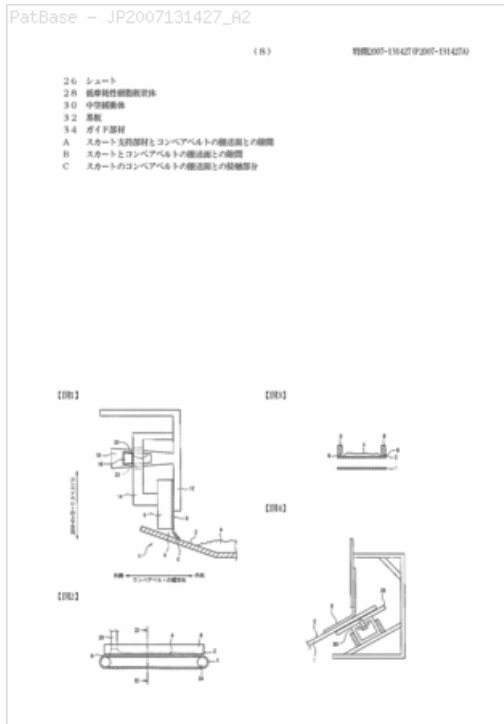
**Abstract:** Source: JP2007131427A PROBLEM TO BE SOLVED: To provide a skirt structure of a belt conveyor capable of improving safety. SOLUTION: In this skirt structure of the belt conveyor provided with a conveyor belt 1 for conveying a conveyance object 4 charged and fed onto a conveyance face 2, a skirt supporting member 6 arranged on a conveyance face 2 side of the conveyor belt 1 with a clearance A between the conveyance face 2 and it, and a skirt 8 supported on the skirt supporting member 6, extending downward, and coming into contact with the conveyance face 2 to block the clearance A, the skirt 8 is formed by a member like a thin plate or a thin film having flexibility and is suspended on the conveyance face 2 from the skirt supporting member 6 while a lower end 8a faces an inner side in the direction of width of the conveyor belt, and a contact part C of the skirt 8 with the conveyance face 2 is brought into contact with the conveyance face 2 by self-weight of the contact part C.

**Classifications:**

**International (IPC 8-9):** B65G15/08 B65G21/20 (Advanced/Invention); B65G15/08 B65G21/20 (Core/Invention)

**CPC:** B65G21/2081

**European:** B65G21/20D2B1



**Family:**

| Publication number | Publication date | Application number | Application date |
|--------------------|------------------|--------------------|------------------|
| JP2007131427 A2    | 20070531         | JP20050327146      | 20051111         |

**Priority:**

JP20050327146 20051111

**Probable Assignee:**

JFE STEEL KK

**Assignee(s):** (std):

JFE STEEL KK

**Assignee(s):**

JFE STEEL CORP

**Inventor(s):** (std):

SAGUCHI YASUKI

**Legal status (INPADOC)**

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| Patent          | Date recorded | Event group | Code  | Event                                       | Details                                                                     |
|-----------------|---------------|-------------|-------|---------------------------------------------|-----------------------------------------------------------------------------|
| JP2007131427 A2 | 20070531      | LSPB        | +     | published / reissued                        |                                                                             |
| JP2007131427 A2 | 20081001      | LSES        | +A621 | WRITTEN REQUEST FOR APPLICATION EXAMINATION | DESCRIPTION : JAPANESE INTERMEDIATE CODE: A621<br>EFFECTIVE DATE : 20080930 |
| JP2007131427 A2 | 20110928      | LSES        | -A131 | NOTIFICATION OF REASONS FOR REFUSAL         | DESCRIPTION : JAPANESE INTERMEDIATE CODE: A131<br>EFFECTIVE DATE : 20110927 |
| JP2007131427 A2 | 20111122      | LSRE        | A521  | WRITTEN AMENDMENT                           | DESCRIPTION : JAPANESE INTERMEDIATE CODE: A523<br>EFFECTIVE DATE : 20111121 |
| JP2007131427 A2 | 20111214      | LSES        | -A131 | NOTIFICATION OF REASONS FOR REFUSAL         | DESCRIPTION : JAPANESE INTERMEDIATE CODE: A131<br>EFFECTIVE DATE :          |

|                 |          |      |      |                     |                                                                                      |
|-----------------|----------|------|------|---------------------|--------------------------------------------------------------------------------------|
| 20111213        |          |      |      |                     |                                                                                      |
| JP2007131427 A2 | 20120209 | LSRE | A521 | WRITTEN AMENDMENT   | DESCRIPTION : JAPANESE<br>INTERMEDIATE CODE:<br>A523<br>EFFECTIVE DATE :<br>20120208 |
| JP2007131427 A2 | 20120328 | LSRV | -A02 | DECISION OF REFUSAL | DESCRIPTION : JAPANESE<br>INTERMEDIATE CODE: A02<br>EFFECTIVE DATE :<br>20120327     |

**Title:** BELT SKIRT FOR PREVENTING STONE FROM FALLING

**Abstract:** Source: KR100846666B A belt skirt for preventing falling stones is provided to prevent a damaged or worn skirt from coming into contact with a conveyor belt without separating a support plate and a cover, by bringing the lower inside of a second skirt into contact with the upside of the conveyor belt all the time by elasticity. A belt skirt is joined to the outer side of a support plate(40) by a crimper in order to prevent ores transferred along a conveyor belt(7) installed at a sorter from flowing over out of the width of the conveyor belt. The belt skirt is composed of a first skirt(20) of which the upper end comes into contact with the outer side of the support plate and the lower end is placed on the upside of the conveyor belt and a second skirt(30) of which an upper end is partially overlapped on the outer side of the first skirt and the lower end is bent outward to come into contact with the upside of the conveyor belt.

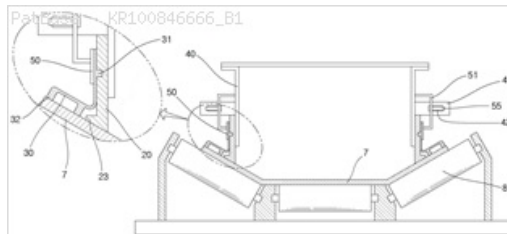
**Classifications:**

**International (IPC 8-9):** B07B13/16 (Advanced/Invention);

B07B13/16 (Advanced/Non-invention);

B07B13/00 (Core/Invention)

**CPC:** B07B13/16 B65G21/2081



**Family:**

| Publication number | Publication date | Application number | Application date |
|--------------------|------------------|--------------------|------------------|
| KR100846666 B1     | 20080716         | KR20080020473      | 20080305         |

**Priority:**

KR20080020473 20080305

**Probable Assignee:**

DAE SHIN URETHANE CO LTD

**Assignee(s):** (std):

DAE SHIN URETHANE CO LTD

**Assignee(s):**

DAE SHIN URETHANE CO

**Inventor(s):** (std):

KIM YONG WOO

**Legal status (INPADOC)**

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| Patent         | Date recorded | Event group | Code  | Event                                             | Details                                            |
|----------------|---------------|-------------|-------|---------------------------------------------------|----------------------------------------------------|
| KR100846666 B1 | 20080716      | LSGT        | +     | granted / extensions (spc, cpc, pte)              |                                                    |
| KR100846666 B1 | 20080305      | LSES        | A201  | REQUEST FOR EXAMINATION                           |                                                    |
| KR100846666 B1 | 20080422      | LSES        | A302  | REQUEST FOR ACCELERATED EXAMINATION               |                                                    |
| KR100846666 B1 | 20080708      | LSGT        | +E701 | DECISION TO GRANT OR REGISTRATION OF PATENT RIGHT |                                                    |
| KR100846666 B1 | 20080710      | LSGT        | +GRNT | WRITTEN DECISION TO GRANT                         |                                                    |
| KR100846666 B1 | 20130808      | LSFE        | FPAY  | ANNUAL FEE PAYMENT                                | PAYMENT DATE : 20130808<br>YEAR OF FEE PAYMENT : 6 |
| KR100846666 B1 | 20140709      | LSFE        | FPAY  | ANNUAL FEE PAYMENT                                | PAYMENT DATE : 20140709<br>YEAR OF FEE PAYMENT : 7 |
| KR100846666 B1 | 20150710      | LSFE        | FPAY  | ANNUAL FEE PAYMENT                                | PAYMENT DATE : 20150710<br>YEAR OF FEE PAYMENT : 8 |
| KR100846666 B1 | 20160711      | LSFE        | FPAY  | ANNUAL FEE PAYMENT                                | PAYMENT DATE : 20160711<br>YEAR OF FEE PAYMENT : 9 |

**Title:** CONVEYOR BELT SKIRT ASSEMBLY

**Abstract:** Source: US2009026047A A conveyor belt skirt assembly adapted to be attached to a side wall of a conveyor mechanism to retain conveyed material on a conveyor belt of the conveyor mechanism. The conveyor belt skirt assembly includes a skirt having a generally vertical leg member and an inclined foot member attached to the bottom end of the leg member. A bracket including an arm and a finger pivotally attaches the skirt to the conveyor mechanism.

**Classifications:**

**International (IPC 8-9):** B65G21/20 (Advanced/Invention);

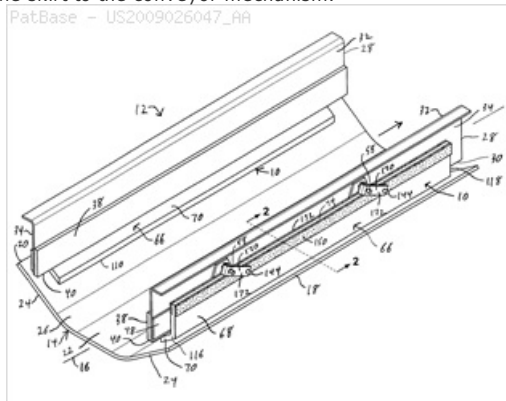
B65G21/20 (Core/Invention)

**CPC:** B65G21/2081

**European:** B65G21/20D2B1

**US:** 198/836.1

PatBase - US2009026047\_AA



**Family:**

| Publication number | Publication date | Application number | Application date |
|--------------------|------------------|--------------------|------------------|
| US2009026047 AA    | 20090129         | US20070828475      | 20070726         |
| US7571802 BB       | 20090811         | US20070828475      | 20070726         |

**Priority:**

US20070828475 20070726

**Probable Assignee:** MARTIN ENGINEERING CO

**Assignee(s):** (std): BOWMAN HOUSTON R ; MARTIN ENG CO

**Assignee(s):** MARTIN ENGINEERING CO ; MARTIN ENGINEERING COMPANY

**Inventor(s):** (std): BOWMAN HOUSTON R

**Agent(s):** THOMPSON COBURN LLP; CLYDE L

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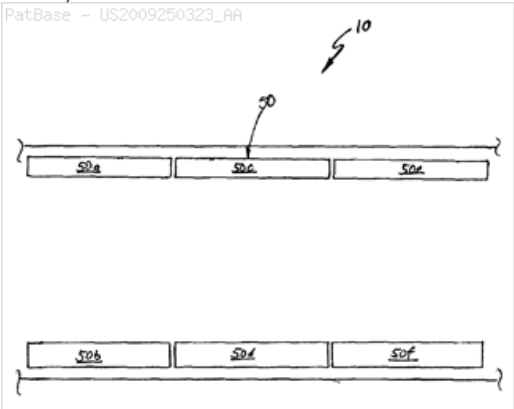
| Patent          | Date recorded | Event group | Code  | Event                                | Details                                                                                                                                                                                                  |
|-----------------|---------------|-------------|-------|--------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| US2009026047 AA | 20090129      | LSPB        | +     | published / reissued                 |                                                                                                                                                                                                          |
| US7571802 BB    | 20090811      | LSGT        | +     | granted / extensions (spc, cpc, pte) |                                                                                                                                                                                                          |
| US7571802 BB    | 20070814      | LSAS        | AS    | ASSIGNMENT                           | PARTYTYPE : OWNER<br>OWNER : MARTIN ENGINEERING COMPANY, ILLINOIS<br>OLDPARTY : ASSIGNMENT OF ASSIGNORS INTEREST;<br>ASSIGNOR:BOWMAN, HOUSTON R.;<br>REEL/FRAME:019692/0199<br>EFFECTIVE DATE : 20070730 |
| US7571802 BB    | 20130211      | LSFE        | +FPAY | FEE PAYMENT                          | YEAR OF FEE PAYMENT : 4                                                                                                                                                                                  |
| US7571802 BB    | 20170213      | LSFE        | +FPAY | FEE PAYMENT                          | YEAR OF FEE PAYMENT : 8                                                                                                                                                                                  |

**Title:** SKIRTBOARD APPARATUS, SYSTEM AND METHOD

**Abstract:** Source: US2009250323A A skirtboard system for a conveyor belt or line comprising at least two skirtboards mutually opposed to one another. Each one of the skirtboards is positioned near the perimeter of the conveyor. Each one of the skirtboards comprises a support plate, a plurality of elements, each one of the elements mutually coupled with the support plate, a liner formed in interstices between the plurality of elements, a beveled nose formed along an edge of the skirtboard panel, the beveled nose complementary to the angle of the conveyor.

**Classifications:**

**International (IPC 8-9):** B65G15/00 B65G17/00  
B65G21/20 (Advanced/Invention);  
B65G21/20 (Core/Invention)  
**CPC:** B65G21/2081  
**European:** B65G21/20D2B1  
**US:** 198/836.1 198/836.100P 198/836.3 198/836.4



**Family:**

| Publication number | Publication date | Application number | Application date |
|--------------------|------------------|--------------------|------------------|
| US2009250323 AA    | 20091008         | US20080061016      | 20080402         |
| US8033386 BB       | 20111011         | US20080061016      | 20080402         |

**Priority:**

US20080061016 20080402

**Probable Assignee:** RICHWOOD IND

**Assignee(s):** (std): RICHWOOD IND ; ROSEBERRY JERRY A ; STOLL BLAINE R

**Assignee(s):** RICHWOOD INDUSTRIES

**Inventor(s):** (std): ROSEBERRY JERRY A ; STOLL BLAINE R

**Agent(s):** ROBERT R WATERS ESQ WATERS LAW OFFICE PLLC; WATERS LAW GROUP; ROBERT R; BRIAN W

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| Patent          | Date recorded | Event group | Code  | Event                                | Details                 |
|-----------------|---------------|-------------|-------|--------------------------------------|-------------------------|
| US2009250323 AA | 20091008      | LSPB        | +     | published / reissued                 |                         |
| US8033386 BB    | 20111011      | LSGT        | +     | granted / extensions (spc, cpc, pte) |                         |
| US8033386 BB    | 20150410      | LSFE        | +FPAY | FEE PAYMENT                          | YEAR OF FEE PAYMENT : 4 |

**Title:** EXTERIORLY MOUNTED WEAR LINER FOR BULK MATERIAL CONVEYOR BELT SYSTEMS

**Abstract:** Source: US2010072034A A bulk material conveyor belt system comprises a belt, a skirt, and a wear liner. The belt forms a continuous loop having an upper transfer run and a lower return run. The belt defines a theoretical, vertically oriented, center plane about which the belt is generally symmetric. The skirt has a lower edge that extends above the transfer run. The wear liner is removably attached to the skirt in a manner such that the skirt lies between the wear liner and the center plane. The wear liner has a lower edge that that extends above the transfer run and beneath the lower edge of the skirt.

**Classifications:**

**International (IPC 8-9):** B65G21/20 B65G47/00 (Advanced/Invention);  
B65G21/20 B65G47/00 (Core/Invention);

B65G21/20 (Core/Non-invention);

B65G (Subclass/Invention)

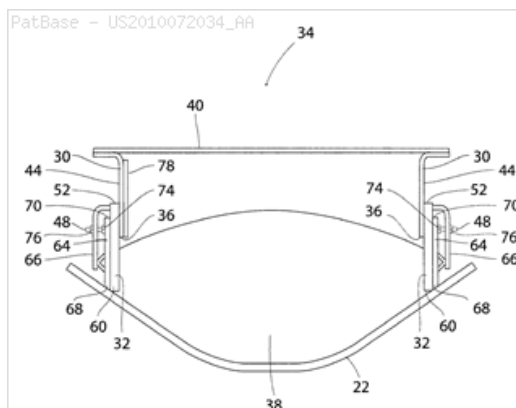
**International (IPC 1-7):** B65G15/60

**CPC:** B65G21/2081

**European:** B65G21/20D2B1

**US:** 198/617 198/617S 198/836.1 198/836.100P 198/836.3

198/836.300S



**Family:**

| Publication number | Publication date | Application number | Application date |
|--------------------|------------------|--------------------|------------------|
| AR073611 AA        | 20101117         | AR2009P103596      | 20090918         |
| AU2009293167 AA    | 20100325         | AU20090293167      | 20090918         |
| AU2009293167 BB    | 20150219         | AU20090293167      | 20090918         |
| BRPI0918630 A2     | 20151201         | BR2009PI18630      | 20090918         |
| CA2730099 AA       | 20110106         | CA20092730099      | 20090918         |
| CA2730099 C        | 20150714         | CA20092730099      | 20090918         |
| CL2011000580 A1    | 20110826         | CL20110000580      | 20110318         |
| CL51397 B          | 20151109         | CL20110000580      | 20110318         |
| CN102131720 A      | 20110720         | CN200980132485     | 20090918         |
| CN102131720 B      | 20150422         | CN200980132485     | 20090918         |
| DE602009036874 D1  | 20160428         | DE200960036874T    | 20090918         |
| EP2323929 A1       | 20110525         | EP20090815235      | 20090918         |
| EP2323929 A4       | 20150805         | EP20090815235      | 20090918         |
| EP2323929 B1       | 20160316         | EP20090815235      | 20090918         |
| ES2572827 T3       | 20160602         | ES20090815235T     | 20090918         |
| IN00194DN2011 A    | 20111216         | IN2011DN00194      | 20110110         |
| MX2011003017 A1    | 20110421         | MX20110003017      | 20090918         |
| PE08822011 A1      | 20111219         | PE20110000611      | 20090918         |
| PL2323929 T3       | 20160930         | PL20090815235T     | 20090918         |
| TW201020188 A      | 20100601         | TW20090131677      | 20090918         |
| TWI501911 B        | 20151001         | TW20090131677      | 20090918         |
| US2010072034 AA    | 20100325         | US20080234384      | 20080919         |
| US8006830 BB       | 20110830         | US20080234384      | 20080919         |
| WO10033760 A1      | 20100325         | WO2009US57409      | 20090918         |
| ZA201100440 A      | 20111026         | ZA20110000440      | 20110117         |

**Priority:**

EP20090815235 20090918 US20080234384 20080919 WO2009US57409 20090918

**Probable Assignee:** MARTIN ENGINEERING CO

**Assignee(s):** (std): MARTIN ENG CO ; SWINDERMAN ROBERT TODD

**Assignee(s):** MARTIN ENGINEERING CO ; MARTIN ENGINEERING CO NEPONSET ; MARTIN ENGINEERING COMPANY ; MARTIN ENGINEERING COMPANYUS

**Inventor(s):** (std): SWINDERMAN ROBERT TODD ; TODD SWINDERMAN ROBERT

**Inventor(s):** ROBERT TODD SWINDERMAN ; SWINDERMAN ROBERT TODD PALM COAST

**Agent(s):** SPRUSON AND FERGUSON; MCFADDEN FINCHAM; OSLER HOSKIN AND HARCOURT LLP; ALESSANDRI; KLING SIMONE; PONTI ADELAIDA; THOMPSON COBURN LLP; CLYDE L; SMITH CLYDE L ET AL

**Designated states:** AE AG AL AM AO AT AU AZ BA BB BE BF BG BH BJ BR BW BY BZ CA CF CG CH CI CL CM CN CO CR CU CY CZ DE DK DM DO DZ EC EE EG ES FI FR GA GB GD GE GH GM GN GQ GR GT GW HN HR HU ID IE IL IN IS IT JP KE KG KM KN KP KR KZ LA LC LI LK LR LS LT LU LV LY MA MC MD ME MG MK ML MN MR MT MW MX MY MZ NA NE NG NI NL NO NZ OM PE PG PH PL PT RO RS RU SC SD SE SG SI SK SL SM SN ST SV SY SZ TD TG TJ TM TN TR TT TZ UA UG US UZ VC VN ZA ZM ZW

**Legal status (INPADOC)**

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| Patent      | Date recorded | Event group | Code | Event                | Details |
|-------------|---------------|-------------|------|----------------------|---------|
| AR073611 AA | 20101117      | LSPB        | +    | published / reissued |         |
| AR073611 AA | 20141203      | LSWD        | -FA  | ABANDONMENT OR       |         |

| WITHDRAWAL      |          |      |       |                                                    |                                                                                                                                                                                                            |  |
|-----------------|----------|------|-------|----------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|
| AU2009293167 AA | 20100325 | LSPB | +     | published / reissued                               |                                                                                                                                                                                                            |  |
| AU2009293167 AA | 20150618 | LSGT | +FGA  | LETTERS PATENT SEALED OR GRANTED (STANDARD PATENT) |                                                                                                                                                                                                            |  |
| AU2009293167 BB | 20150219 | LSGT | +     | granted / extensions (spc, cpc, pte)               |                                                                                                                                                                                                            |  |
| BRPI0918630 A2  | 20151201 | LSPB | +     | published / reissued                               |                                                                                                                                                                                                            |  |
| CA2730099 AA    | 20110106 | LSPB | +     | published / reissued                               |                                                                                                                                                                                                            |  |
| CA2730099 AA    | 20140923 | LSES | +EEER | EXAMINATION REQUEST                                | EFFECTIVE DATE : 20140909                                                                                                                                                                                  |  |
| CA2730099 C     | 20150714 | LSGT | +     | granted / extensions (spc, cpc, pte)               |                                                                                                                                                                                                            |  |
| CL2011000580 A1 | 20110826 | LSPB | +     | published / reissued                               |                                                                                                                                                                                                            |  |
| CL51397 B       | 20151109 | LSGT | +     | granted / extensions (spc, cpc, pte)               |                                                                                                                                                                                                            |  |
| CN102131720 A   | 20110720 | LSPB | +     | published / reissued                               |                                                                                                                                                                                                            |  |
| CN102131720 A   | 20110720 | LSPB | +C06  | PUBLICATION                                        |                                                                                                                                                                                                            |  |
| CN102131720 A   | 20150422 | LSGT | +C14  | GRANT OF PATENT OR UTILITY MODEL                   |                                                                                                                                                                                                            |  |
| CN102131720 B   | 20150422 | LSGT | +     | granted / extensions (spc, cpc, pte)               |                                                                                                                                                                                                            |  |
| EP2323929 A1    | 20110525 | LSPB | +     | published / reissued                               |                                                                                                                                                                                                            |  |
| EP2323929 A1    | 20110525 | LSES | +17P  | REQUEST FOR EXAMINATION FILED                      | EFFECTIVE DATE : 20110215                                                                                                                                                                                  |  |
| EP2323929 A1    | 20150805 | LSES | +RA4  | DESPATCH OF SUPPLEMENTARY SEARCH REPORT            | EFFECTIVE DATE : 20150708                                                                                                                                                                                  |  |
| EP2323929 A1    | 20150805 | LSRE | RIC1  | CLASSIFICATION (CORRECTION)                        | CLASSIFICATIONSCHEME : IPC<br>CLASSIFICATIONSYMBOL : B65G 21/20<br>20060101AFI20150702BHEP                                                                                                                 |  |
| EP2323929 A1    | 20151202 | LSGT | +INTG | ANNOUNCEMENT OF INTENTION TO GRANT                 | EFFECTIVE DATE : 20151104                                                                                                                                                                                  |  |
| EP2323929 A1    | 20160316 | LSGT | REG   | REFERENCE TO A NATIONAL CODE                       | REF COUNTRY CODE : GB<br>REF LEGAL EVENT CODE : FG4D                                                                                                                                                       |  |
| EP2323929 A1    | 20160331 | LSNP | REG   | REFERENCE TO A NATIONAL CODE                       | REF COUNTRY CODE : CH<br>REF LEGAL EVENT CODE : EP                                                                                                                                                         |  |
| EP2323929 A1    | 20160406 | LSGT | REG   | REFERENCE TO A NATIONAL CODE                       | REF COUNTRY CODE : IE<br>REF LEGAL EVENT CODE : FG4D                                                                                                                                                       |  |
| EP2323929 A1    | 20160415 | LSNP | REG   | REFERENCE TO A NATIONAL CODE                       | REF COUNTRY CODE : AT<br>REF LEGAL EVENT CODE : REF<br>REF DOCUMENT NUMBER : 781013<br>COUNTRY OF REF DOCUMENT : AT<br>KIND CODE OF REF DOCUMENT : T<br>DESIGNATED STATE(S) :<br>EFFECTIVE DATE : 20160415 |  |
| EP2323929 A1    | 20160428 | LSPB | REG   | REFERENCE TO A NATIONAL CODE                       | REF COUNTRY CODE : DE<br>REF LEGAL EVENT CODE : R096<br>REF DOCUMENT NUMBER : 602009036874<br>COUNTRY OF REF DOCUMENT : DE                                                                                 |  |
| EP2323929 A1    | 20160602 | LSGT | REG   | REFERENCE TO A NATIONAL CODE                       | REF COUNTRY CODE : ES<br>REF LEGAL EVENT CODE : FG2A<br>REF DOCUMENT NUMBER : 2572827<br>COUNTRY OF REF DOCUMENT : ES<br>KIND CODE OF REF DOCUMENT : T3                                                    |  |

|              |          |      |       |                                                                                                         |                                                                                                                                                                                                                          |
|--------------|----------|------|-------|---------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|              |          |      |       |                                                                                                         | DESIGNATED STATE(S) :<br>EFFECTIVE DATE : 20160602                                                                                                                                                                       |
| EP2323929 A1 | 20160725 | LSRV | REG   | REFERENCE TO A<br>NATIONAL CODE                                                                         | REF COUNTRY CODE : LT<br>REF LEGAL EVENT CODE : MG4D                                                                                                                                                                     |
| EP2323929 A1 | 20160729 | LSLE | -PG25 | LAPSED IN A<br>CONTRACTING<br>STATE ANNOUNCED<br>VIA POSTGRANT<br>INFORM. FROM<br>NAT. OFFICE TO<br>EPO | COUNTRY OF REF DOCUMENT :<br>HR<br>NOTIFICATIONOFLAPSE : LAPSE<br>BECAUSE OF FAILURE TO SUBMIT<br>A TRANSLATION OF THE<br>DESCRIPTION OR TO PAY THE<br>FEE WITHIN THE PRESCRIBED<br>TIME-LIMIT<br>LAPSED DATE : 20160316 |
| EP2323929 A1 | 20160729 | LSLE | -PG25 | LAPSED IN A<br>CONTRACTING<br>STATE ANNOUNCED<br>VIA POSTGRANT<br>INFORM. FROM<br>NAT. OFFICE TO<br>EPO | COUNTRY OF REF DOCUMENT : FI<br>NOTIFICATIONOFLAPSE : LAPSE<br>BECAUSE OF FAILURE TO SUBMIT<br>A TRANSLATION OF THE<br>DESCRIPTION OR TO PAY THE<br>FEE WITHIN THE PRESCRIBED<br>TIME-LIMIT<br>LAPSED DATE : 20160316    |
| EP2323929 A1 | 20160729 | LSLE | -PG25 | LAPSED IN A<br>CONTRACTING<br>STATE ANNOUNCED<br>VIA POSTGRANT<br>INFORM. FROM<br>NAT. OFFICE TO<br>EPO | COUNTRY OF REF DOCUMENT :<br>NO<br>NOTIFICATIONOFLAPSE : LAPSE<br>BECAUSE OF FAILURE TO SUBMIT<br>A TRANSLATION OF THE<br>DESCRIPTION OR TO PAY THE<br>FEE WITHIN THE PRESCRIBED<br>TIME-LIMIT<br>LAPSED DATE : 20160616 |
| EP2323929 A1 | 20160729 | LSLE | -PG25 | LAPSED IN A<br>CONTRACTING<br>STATE ANNOUNCED<br>VIA POSTGRANT<br>INFORM. FROM<br>NAT. OFFICE TO<br>EPO | COUNTRY OF REF DOCUMENT :<br>GR<br>NOTIFICATIONOFLAPSE : LAPSE<br>BECAUSE OF FAILURE TO SUBMIT<br>A TRANSLATION OF THE<br>DESCRIPTION OR TO PAY THE<br>FEE WITHIN THE PRESCRIBED<br>TIME-LIMIT<br>LAPSED DATE : 20160617 |
| EP2323929 A1 | 20160815 | LSRV | REG   | REFERENCE TO A<br>NATIONAL CODE                                                                         | REF COUNTRY CODE : AT<br>REF LEGAL EVENT CODE : MK05<br>REF DOCUMENT NUMBER :<br>781013<br>COUNTRY OF REF DOCUMENT :<br>AT<br>KIND CODE OF REF DOCUMENT :<br>T<br>DESIGNATED STATE(S) :<br>EFFECTIVE DATE : 20160316     |
| EP2323929 A1 | 20160831 | LSLE | -PG25 | LAPSED IN A<br>CONTRACTING<br>STATE ANNOUNCED<br>VIA POSTGRANT<br>INFORM. FROM<br>NAT. OFFICE TO<br>EPO | COUNTRY OF REF DOCUMENT :<br>NL<br>NOTIFICATIONOFLAPSE : LAPSE<br>BECAUSE OF FAILURE TO SUBMIT<br>A TRANSLATION OF THE<br>DESCRIPTION OR TO PAY THE<br>FEE WITHIN THE PRESCRIBED<br>TIME-LIMIT<br>LAPSED DATE : 20160316 |
| EP2323929 A1 | 20160831 | LSLE | -PG25 | LAPSED IN A<br>CONTRACTING<br>STATE ANNOUNCED<br>VIA POSTGRANT<br>INFORM. FROM<br>NAT. OFFICE TO<br>EPO | COUNTRY OF REF DOCUMENT :<br>LT<br>NOTIFICATIONOFLAPSE : LAPSE<br>BECAUSE OF FAILURE TO SUBMIT<br>A TRANSLATION OF THE<br>DESCRIPTION OR TO PAY THE<br>FEE WITHIN THE PRESCRIBED<br>TIME-LIMIT<br>LAPSED DATE : 20160316 |
| EP2323929 A1 | 20160831 | LSLE | -PG25 | LAPSED IN A<br>CONTRACTING<br>STATE ANNOUNCED<br>VIA POSTGRANT<br>INFORM. FROM<br>NAT. OFFICE TO<br>EPO | COUNTRY OF REF DOCUMENT :<br>LV<br>NOTIFICATIONOFLAPSE : LAPSE<br>BECAUSE OF FAILURE TO SUBMIT<br>A TRANSLATION OF THE<br>DESCRIPTION OR TO PAY THE<br>FEE WITHIN THE PRESCRIBED<br>TIME-LIMIT<br>LAPSED DATE : 20160316 |
| EP2323929 A1 | 20160831 | LSLE | -PG25 | LAPSED IN A<br>CONTRACTING<br>STATE ANNOUNCED<br>VIA POSTGRANT<br>INFORM. FROM<br>NAT. OFFICE TO<br>EPO | COUNTRY OF REF DOCUMENT :<br>SE<br>NOTIFICATIONOFLAPSE : LAPSE<br>BECAUSE OF FAILURE TO SUBMIT<br>A TRANSLATION OF THE<br>DESCRIPTION OR TO PAY THE<br>FEE WITHIN THE PRESCRIBED<br>TIME-LIMIT<br>LAPSED DATE : 20160316 |
| EP2323929 A1 | 20160926 | LSFE | REG   | REFERENCE TO A                                                                                          | COUNTRY OF REF DOCUMENT :                                                                                                                                                                                                |

|              |          |      |       | NATIONAL CODE                                                                         | FR<br>REF COUNTRY CODE : FR<br>REF LEGAL EVENT CODE : PLFP<br>YEAR OF FEE PAYMENT : 8                                                                                                                  |
|--------------|----------|------|-------|---------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| EP2323929 A1 | 20161031 | LSLE | -PG25 | LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO | COUNTRY OF REF DOCUMENT : EE<br>NOTIFICATIONOFLAPSE : LAPSE BECAUSE OF FAILURE TO SUBMIT A TRANSLATION OF THE DESCRIPTION OR TO PAY THE FEE WITHIN THE PRESCRIBED TIME-LIMIT<br>LAPSED DATE : 20160316 |
| EP2323929 A1 | 20161031 | LSLE | -PG25 | LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO | COUNTRY OF REF DOCUMENT : IS<br>NOTIFICATIONOFLAPSE : LAPSE BECAUSE OF FAILURE TO SUBMIT A TRANSLATION OF THE DESCRIPTION OR TO PAY THE FEE WITHIN THE PRESCRIBED TIME-LIMIT<br>LAPSED DATE : 20160716 |
| EP2323929 A1 | 20161031 | LSFE | +PGFP | POSTGRANT: ANNUAL FEES PAID TO NATIONAL OFFICE                                        | COUNTRY OF REF DOCUMENT : GB<br>PAYMENT DATE : 20160927<br>YEAR OF FEE PAYMENT : 8                                                                                                                     |
| EP2323929 A1 | 20161031 | LSFE | +PGFP | POSTGRANT: ANNUAL FEES PAID TO NATIONAL OFFICE                                        | COUNTRY OF REF DOCUMENT : IE<br>PAYMENT DATE : 20160927<br>YEAR OF FEE PAYMENT : 8                                                                                                                     |
| EP2323929 A1 | 20161130 | LSLE | -PG25 | LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO | COUNTRY OF REF DOCUMENT : RO<br>NOTIFICATIONOFLAPSE : LAPSE BECAUSE OF FAILURE TO SUBMIT A TRANSLATION OF THE DESCRIPTION OR TO PAY THE FEE WITHIN THE PRESCRIBED TIME-LIMIT<br>LAPSED DATE : 20160316 |
| EP2323929 A1 | 20161130 | LSLE | -PG25 | LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO | COUNTRY OF REF DOCUMENT : SK<br>NOTIFICATIONOFLAPSE : LAPSE BECAUSE OF FAILURE TO SUBMIT A TRANSLATION OF THE DESCRIPTION OR TO PAY THE FEE WITHIN THE PRESCRIBED TIME-LIMIT<br>LAPSED DATE : 20160316 |
| EP2323929 A1 | 20161130 | LSLE | -PG25 | LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO | COUNTRY OF REF DOCUMENT : CZ<br>NOTIFICATIONOFLAPSE : LAPSE BECAUSE OF FAILURE TO SUBMIT A TRANSLATION OF THE DESCRIPTION OR TO PAY THE FEE WITHIN THE PRESCRIBED TIME-LIMIT<br>LAPSED DATE : 20160316 |
| EP2323929 A1 | 20161130 | LSLE | -PG25 | LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO | COUNTRY OF REF DOCUMENT : SM<br>NOTIFICATIONOFLAPSE : LAPSE BECAUSE OF FAILURE TO SUBMIT A TRANSLATION OF THE DESCRIPTION OR TO PAY THE FEE WITHIN THE PRESCRIBED TIME-LIMIT<br>LAPSED DATE : 20160316 |
| EP2323929 A1 | 20161130 | LSLE | -PG25 | LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO | COUNTRY OF REF DOCUMENT : PT<br>NOTIFICATIONOFLAPSE : LAPSE BECAUSE OF FAILURE TO SUBMIT A TRANSLATION OF THE DESCRIPTION OR TO PAY THE FEE WITHIN THE PRESCRIBED TIME-LIMIT<br>LAPSED DATE : 20160718 |
| EP2323929 A1 | 20161130 | LSLE | -PG25 | LAPSED IN A CONTRACTING STATE ANNOUNCED VIA POSTGRANT INFORM. FROM NAT. OFFICE TO EPO | COUNTRY OF REF DOCUMENT : AT<br>NOTIFICATIONOFLAPSE : LAPSE BECAUSE OF FAILURE TO SUBMIT A TRANSLATION OF THE DESCRIPTION OR TO PAY THE FEE WITHIN THE PRESCRIBED TIME-LIMIT<br>LAPSED DATE : 20160316 |
| EP2323929 A1 | 20161130 | LSFE | +PGFP | POSTGRANT: ANNUAL FEES PAID TO NATIONAL OFFICE                                        | COUNTRY OF REF DOCUMENT : FR<br>PAYMENT DATE : 20160926<br>YEAR OF FEE PAYMENT : 8                                                                                                                     |

|                 |          |      |       |                                                                                                         |                                                                                                                                                                                                                          |
|-----------------|----------|------|-------|---------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| EP2323929 A1    | 20161130 | LSFE | +PGFP | POSTGRANT:<br>ANNUAL FEES PAID<br>TO NATIONAL<br>OFFICE                                                 | COUNTRY OF REF DOCUMENT :<br>PL<br>PAYMENT DATE : 20160920<br>YEAR OF FEE PAYMENT : 8                                                                                                                                    |
| EP2323929 A1    | 20161219 | LSRE | REG   | REFERENCE TO A<br>NATIONAL CODE                                                                         | REF COUNTRY CODE : DE<br>REF LEGAL EVENT CODE : R097<br>REF DOCUMENT NUMBER :<br>602009036874<br>COUNTRY OF REF DOCUMENT :<br>DE                                                                                         |
| EP2323929 A1    | 20161230 | LSLE | -PG25 | LAPSED IN A<br>CONTRACTING<br>STATE ANNOUNCED<br>VIA POSTGRANT<br>INFORM. FROM<br>NAT. OFFICE TO<br>EPO | COUNTRY OF REF DOCUMENT :<br>BE<br>NOTIFICATIONOFLAPSE : LAPSE<br>BECAUSE OF FAILURE TO SUBMIT<br>A TRANSLATION OF THE<br>DESCRIPTION OR TO PAY THE<br>FEE WITHIN THE PRESCRIBED<br>TIME-LIMIT<br>LAPSED DATE : 20160316 |
| EP2323929 A1    | 20161230 | LSFE | +PGFP | POSTGRANT:<br>ANNUAL FEES PAID<br>TO NATIONAL<br>OFFICE                                                 | COUNTRY OF REF DOCUMENT :<br>TR<br>PAYMENT DATE : 20160921<br>YEAR OF FEE PAYMENT : 8                                                                                                                                    |
| EP2323929 A1    | 20161230 | LSFE | +PGFP | POSTGRANT:<br>ANNUAL FEES PAID<br>TO NATIONAL<br>OFFICE                                                 | COUNTRY OF REF DOCUMENT :<br>ES<br>PAYMENT DATE : 20160926<br>YEAR OF FEE PAYMENT : 8                                                                                                                                    |
| EP2323929 A1    | 20170131 | LSLE | -PG25 | LAPSED IN A<br>CONTRACTING<br>STATE ANNOUNCED<br>VIA POSTGRANT<br>INFORM. FROM<br>NAT. OFFICE TO<br>EPO | COUNTRY OF REF DOCUMENT :<br>DK<br>NOTIFICATIONOFLAPSE : LAPSE<br>BECAUSE OF FAILURE TO SUBMIT<br>A TRANSLATION OF THE<br>DESCRIPTION OR TO PAY THE<br>FEE WITHIN THE PRESCRIBED<br>TIME-LIMIT<br>LAPSED DATE : 20160316 |
| EP2323929 A1    | 20170131 | LSFE | +PGFP | POSTGRANT:<br>ANNUAL FEES PAID<br>TO NATIONAL<br>OFFICE                                                 | COUNTRY OF REF DOCUMENT :<br>DE<br>PAYMENT DATE : 20160928<br>YEAR OF FEE PAYMENT : 8                                                                                                                                    |
| EP2323929 A1    | 20170222 | LSGT | +26N  | NO OPPOSITION<br>FILED                                                                                  | EFFECTIVE DATE : 20161219                                                                                                                                                                                                |
| EP2323929 A1    | 20170228 | LSLE | -PG25 | LAPSED IN A<br>CONTRACTING<br>STATE ANNOUNCED<br>VIA POSTGRANT<br>INFORM. FROM<br>NAT. OFFICE TO<br>EPO | COUNTRY OF REF DOCUMENT :<br>BG<br>NOTIFICATIONOFLAPSE : LAPSE<br>BECAUSE OF FAILURE TO SUBMIT<br>A TRANSLATION OF THE<br>DESCRIPTION OR TO PAY THE<br>FEE WITHIN THE PRESCRIBED<br>TIME-LIMIT<br>LAPSED DATE : 20160616 |
| EP2323929 A1    | 20170228 | LSFE | +PGFP | POSTGRANT:<br>ANNUAL FEES PAID<br>TO NATIONAL<br>OFFICE                                                 | COUNTRY OF REF DOCUMENT : IT<br>PAYMENT DATE : 20160923<br>YEAR OF FEE PAYMENT : 8                                                                                                                                       |
| EP2323929 A1    | 20170428 | LSLE | -PG25 | LAPSED IN A<br>CONTRACTING<br>STATE ANNOUNCED<br>VIA POSTGRANT<br>INFORM. FROM<br>NAT. OFFICE TO<br>EPO | COUNTRY OF REF DOCUMENT :<br>MC<br>NOTIFICATIONOFLAPSE : LAPSE<br>BECAUSE OF FAILURE TO SUBMIT<br>A TRANSLATION OF THE<br>DESCRIPTION OR TO PAY THE<br>FEE WITHIN THE PRESCRIBED<br>TIME-LIMIT<br>LAPSED DATE : 20160316 |
| EP2323929 A1    | 20170428 | LSLE | REG   | REFERENCE TO A<br>NATIONAL CODE                                                                         | REF COUNTRY CODE : CH<br>REF LEGAL EVENT CODE : PL                                                                                                                                                                       |
| EP2323929 B1    | 20160316 | LSGT | +     | granted /<br>extensions (spc,<br>cpc, pte)                                                              |                                                                                                                                                                                                                          |
| ES2572827 T3    | 20160602 | LSGT | +     | granted /<br>extensions (spc,<br>cpc, pte)                                                              |                                                                                                                                                                                                                          |
| IN00194DN2011 A | 20111216 | LSPB | +     | published /<br>reissued                                                                                 |                                                                                                                                                                                                                          |
| MX2011003017 A1 | 20110421 | LSPB | +     | published /<br>reissued                                                                                 |                                                                                                                                                                                                                          |
| MX2011003017 A1 | 20140620 | LSGT | +FG   | GRANT OR<br>REGISTRATION                                                                                |                                                                                                                                                                                                                          |
| PE08822011 A1   | 20111219 | LSPB | +     | published /<br>reissued                                                                                 |                                                                                                                                                                                                                          |
| PE08822011 A1   | 20140922 | LSGT | +FG   | GRANT,                                                                                                  |                                                                                                                                                                                                                          |

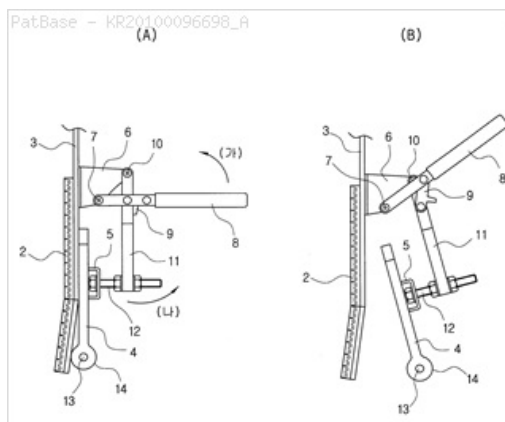
|                 |          |      |       |                                             |                                                                                                                                                                                                                                            |
|-----------------|----------|------|-------|---------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| REGISTRATION    |          |      |       |                                             |                                                                                                                                                                                                                                            |
| PL2323929 T3    | 20160930 | LSGT | +     | granted / extensions (spc, cpc, pte)        |                                                                                                                                                                                                                                            |
| TW201020188 A   | 20100601 | LSPB | +     | published / reissued                        |                                                                                                                                                                                                                                            |
| TWI501911 B     | 20151001 | LSGT | +     | granted / extensions (spc, cpc, pte)        |                                                                                                                                                                                                                                            |
| US2010072034 AA | 20100325 | LSPB | +     | published / reissued                        |                                                                                                                                                                                                                                            |
| US2010072034 AA | 20081113 | LSAS | AS    | ASSIGNMENT                                  | OWNER NAME : MARTIN ENGINEERING COMPANY, ILLINOIS<br>DESCRIPTION : ASSIGNMENT OF ASSIGNORS INTEREST;<br>ASSIGNOR: SWINDERMAN, ROBERT TODD;<br>REEL/FRAME: 021826/0852<br>EFFECTIVE DATE : 20081027                                         |
| US2010072034 AA | 20081113 | LSAS | AS    | ASSIGNMENT                                  | OWNER NAME : MARTIN ENGINEERING COMPANY, ILLINOIS<br>DESCRIPTION : ASSIGNMENT OF ASSIGNORS INTEREST;<br>ASSIGNOR: SWINDERMAN, ROBERT TODD; US-ASSIGNMENT DATABASE UPDATED: 20100325;<br>REEL/FRAME: 21826/852<br>EFFECTIVE DATE : 20081027 |
| US8006830 BB    | 20110830 | LSGT | +     | granted / extensions (spc, cpc, pte)        |                                                                                                                                                                                                                                            |
| US8006830 BB    | 20081113 | LSAS | AS    | ASSIGNMENT                                  | OWNER NAME : MARTIN ENGINEERING COMPANY, ILLINOIS<br>DESCRIPTION : ASSIGNMENT OF ASSIGNORS INTEREST;<br>ASSIGNOR: SWINDERMAN, ROBERT TODD;<br>REEL/FRAME: 021826/0852<br>EFFECTIVE DATE : 20081027                                         |
| US8006830 BB    | 20081113 | LSAS | AS    | ASSIGNMENT                                  | OWNER NAME : MARTIN ENGINEERING COMPANY, ILLINOIS<br>DESCRIPTION : ASSIGNMENT OF ASSIGNORS INTEREST;<br>ASSIGNOR: SWINDERMAN, ROBERT TODD;<br>REEL/FRAME: 021826/0852<br>EFFECTIVE DATE : 20081027                                         |
| US8006830 BB    | 20150302 | LSFE | +FPAY | FEE PAYMENT                                 | YEAR OF FEE PAYMENT : 4                                                                                                                                                                                                                    |
| WO10033760 A1   | 20100325 | LSPB | +     | published / reissued                        |                                                                                                                                                                                                                                            |
| WO10033760 A1   | 20110106 | LSNP | ENP   | ENTRY INTO THE NATIONAL PHASE IN:           | REF DOCUMENT NUMBER : 2730099<br>COUNTRY OF REF DOCUMENT : CA                                                                                                                                                                              |
| WO10033760 A1   | 20110111 | LSNP | +WWE  | WIPO INFORMATION: ENTRY INTO NATIONAL PHASE | REF DOCUMENT NUMBER : 2009293167<br>COUNTRY OF REF DOCUMENT : AU                                                                                                                                                                           |
| WO10033760 A1   | 20110203 | LSNP | ENP   | ENTRY INTO THE NATIONAL PHASE IN:           | REF DOCUMENT NUMBER : 2009293167<br>COUNTRY OF REF DOCUMENT : AU<br>DATE OF REF DOCUMENT : 20090918<br>KIND CODE OF REF DOCUMENT : A                                                                                                       |
| WO10033760 A1   | 20110322 | LSNE | NENP  | NON-ENTRY INTO THE NATIONAL PHASE IN:       | REF COUNTRY CODE : DE                                                                                                                                                                                                                      |
| WO10033760 A1   | 20151201 | LSNP | ENP   | ENTRY INTO THE NATIONAL PHASE IN:           | REF DOCUMENT NUMBER : PI0918630<br>COUNTRY OF REF DOCUMENT : BR<br>KIND CODE OF REF DOCUMENT : A2<br>EFFECTIVE DATE : 20110316                                                                                                             |
| ZA201100440 A   | 20111026 | LSGT | +     | granted / extensions (spc, cpc, pte)        |                                                                                                                                                                                                                                            |

**Title:** SKIRT CLAMPING APPARATUS FOR CONVEYOR BELT

**Abstract:** Source: KR20100096698A PURPOSE: A skirt clamping device for a conveyor belt is provided to improve adhesion between a conveyor belt and a skirt and to conveniently replace the skirt by easily separating the skirt from the conveyor belt. CONSTITUTION: A skirt clamping device for a conveyor belt comprises a conveyor belt(1), wear liners(2), a side cover, and a skirt(4). The wear liners are installed in both side edges of the conveyor belt and block dust. The side cover is in contact with the wear liners. The skirt is in contact with the side cover, and the bottom end of the skirt is in contact with the top surface of the conveyor belt.

**Classifications:**

**International (IPC 8-9):** B65G15/08 B65G21/20  
B65G21/22 (Advanced/Invention)

**Family:**

| Publication number | Publication date | Application number | Application date |
|--------------------|------------------|--------------------|------------------|
| KR101041172 B1     | 20110613         | KR20090015711      | 20090225         |
| KR20100096698 A    | 20100902         | KR20090015711      | 20090225         |

**Priority:**

KR20090015711 20090225

**Probable Assignee:**

PARK HEE SUNG

**Assignee(s): (std):**

PARK HEE SUNG

**Inventor(s): (std):**

PARK HEE SUNG

**Legal status (INPADOC)**

[View legal status timeline](#)

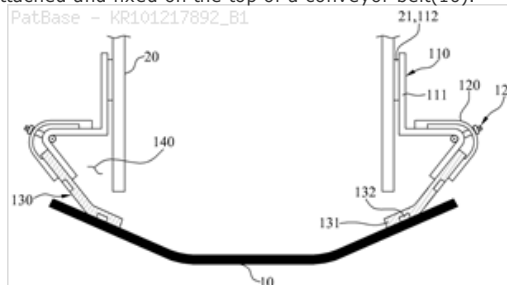
| Patent          | Date recorded | Event group | Code  | Event                                             | Details                                            |
|-----------------|---------------|-------------|-------|---------------------------------------------------|----------------------------------------------------|
| KR101041172 B1  | 20110613      | LSGT        | +     | granted / extensions (spc, cpc, pte)              |                                                    |
| KR101041172 B1  | 20090225      | LSSES       | A201  | REQUEST FOR EXAMINATION                           |                                                    |
| KR101041172 B1  | 20110316      | LSSES       | -E902 | NOTIFICATION OF REASON FOR REFUSAL                |                                                    |
| KR101041172 B1  | 20110526      | LSGT        | +E701 | DECISION TO GRANT OR REGISTRATION OF PATENT RIGHT |                                                    |
| KR101041172 B1  | 20110607      | LSGT        | +GRNT | WRITTEN DECISION TO GRANT                         |                                                    |
| KR101041172 B1  | 20140605      | LSFE        | FPAY  | ANNUAL FEE PAYMENT                                | PAYMENT DATE : 20140605<br>YEAR OF FEE PAYMENT : 4 |
| KR101041172 B1  | 20150706      | LSFE        | FPAY  | ANNUAL FEE PAYMENT                                | PAYMENT DATE : 20150706<br>YEAR OF FEE PAYMENT : 5 |
| KR101041172 B1  | 20160706      | LSFE        | FPAY  | ANNUAL FEE PAYMENT                                | PAYMENT DATE : 20160706<br>YEAR OF FEE PAYMENT : 6 |
| KR20100096698 A | 20100902      | LSPB        | +     | published / reissued                              |                                                    |

**Title:** A BELT SKIRT APPARATUS OF SPACE FORM OF SELF-WEIGH TYPE

**Abstract:** Source: KR101217892B PURPOSE: A self-supporting spaced type belt skirt device is provided to prevent transferred articles moving on a conveyor from dropping by having an arch-shaped structure. CONSTITUTION: A self-supporting spaced type belt skirt device comprises a self-supporting spaced type seal cover(110), an outer cover(120), and a belt skirt(130). The bottom of the self-supporting spaced type seal cover is a reversed-L shape and is extended from a vertical plate(111) which is coupled to a chute wall(20). The outer cover is coupled at the outside of the self-supporting spaced type seal cover by a bolt coupling part(121). The belt skirt is coupled between the self-supporting spaced type seal cover and the outer cover. The bottom part(131) of the belt skirt is attached and fixed on the top of a conveyor belt(10).

**Classifications:**

**International (IPC 8-9):** B65G11/20 B65G15/08 B65G21/20  
B65G69/18 (Advanced/Invention)



**Family:**

| Publication number | Publication date | Application number | Application date |
|--------------------|------------------|--------------------|------------------|
| KR101217892 B1     | 20130114         | KR20120069500      | 20120627         |

**Priority:**

KR20120069500 20120627

**Probable Assignee:**

KEC CO LTD

**Assignee(s): (std):**

KEC CO LTD ; KEC CORP

**Assignee(s):**

KEC CO

**Inventor(s): (std):**

JEH JONG WOOK

**Legal status (INPADOC)**

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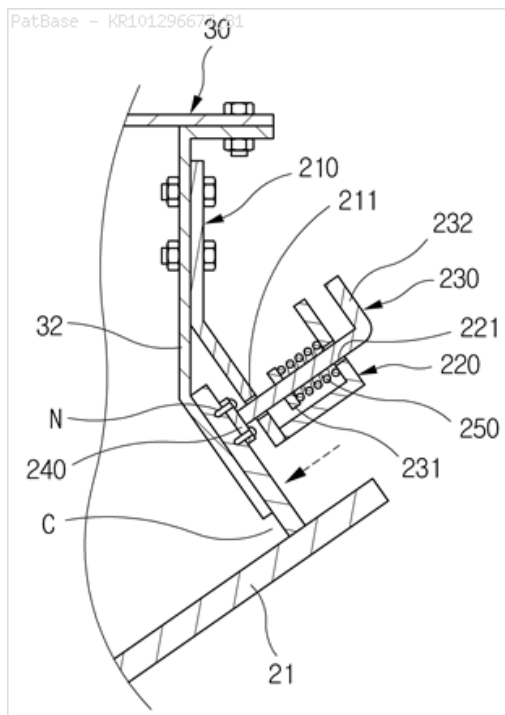
| Patent         | Date recorded | Event group | Code  | Event                                             | Details                                            |
|----------------|---------------|-------------|-------|---------------------------------------------------|----------------------------------------------------|
| KR101217892 B1 | 20130114      | LSGT        | +     | granted / extensions (spc, cpc, pte)              |                                                    |
| KR101217892 B1 | 20120627      | LSES        | A201  | REQUEST FOR EXAMINATION                           |                                                    |
| KR101217892 B1 | 20120907      | LSES        | A302  | REQUEST FOR ACCELERATED EXAMINATION               |                                                    |
| KR101217892 B1 | 20120925      | LSES        | -E902 | NOTIFICATION OF REASON FOR REFUSAL                |                                                    |
| KR101217892 B1 | 20121128      | LSGT        | +E701 | DECISION TO GRANT OR REGISTRATION OF PATENT RIGHT |                                                    |
| KR101217892 B1 | 20121226      | LSGT        | +GRNT | WRITTEN DECISION TO GRANT                         |                                                    |
| KR101217892 B1 | 20151223      | LSFE        | FPAY  | ANNUAL FEE PAYMENT                                | PAYMENT DATE : 20151223<br>YEAR OF FEE PAYMENT : 4 |
| KR101217892 B1 | 20161226      | LSFE        | FPAY  | ANNUAL FEE PAYMENT                                | PAYMENT DATE : 20161226<br>YEAR OF FEE PAYMENT : 5 |

**Title:** SKIRT FIXING DEVICE FOR MATERIAL TRANSPORT CONVEYOR

**Abstract:** Source: KR101296677B PURPOSE: A skirt fixing apparatus for a material conveyor is provided to increase a fixing force between the side wall of an anti-dust cover and a skirt, and to improve the airtightness of the skirt closing a gap between the belt and the side wall. CONSTITUTION: A skirt fixing apparatus for a material conveyor includes a first support (210), a second support (220), a pushing unit (230), a fixing part (240), and an elastic member (250). The top of the first support outside the side wall of an anti-dust cover (30) is fixed to the upper side of the side wall, and the bottom of the first support is oppositely separated from the lower side of the side wall. One side of the second support outside the first support is fixed to the bottom of the first support, and the other side of the second support is oppositely separated from the bottom of the first support. One end of the pushing unit penetrates the bottom of the first support, and the other end of the pushing unit penetrates the other side of the second support. The pushing unit slides toward the lower side of the side wall. The fixing part at one end of the pushing unit fixes the outer upper side of a skirt. The elastic member is inserted into the periphery of the pushing unit. One end of the elastic member is supported by the other side of the second support, and the other end of the elastic member is supported by the inner side of the pushing unit. The elastic member pushes the pushing unit so that the skirt adheres to the lower side of the side wall.

**Classifications:**

**International (IPC 8-9):** B65G21/08 B65G21/20  
B65G69/18 (Advanced/Invention)

**Family:**

| Publication number | Publication date | Application number | Application date |
|--------------------|------------------|--------------------|------------------|
| KR101296677 B1     | 20130814         | KR20120056520      | 20120529         |

**Priority:**

KR20120056520 20120529

**Probable Assignee:**

HYUNDAI ROTEM CO

**Assignee(s): (std):**

HYUNDAI ROTEM CO

**Assignee(s):**

HYUNDAI ROTEM COMPANY

**Inventor(s): (std):**

KIM SUNG KYU

**Legal status (INPADOC)**

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| Patent         | Date recorded | Event group | Code  | Event                                             | Details                                            |
|----------------|---------------|-------------|-------|---------------------------------------------------|----------------------------------------------------|
| KR101296677 B1 | 20130814      | LSGT        | +     | granted / extensions (spc, cpc, pte)              |                                                    |
| KR101296677 B1 | 20120529      | LSES        | A201  | REQUEST FOR EXAMINATION                           |                                                    |
| KR101296677 B1 | 20130722      | LSGT        | +E701 | DECISION TO GRANT OR REGISTRATION OF PATENT RIGHT |                                                    |
| KR101296677 B1 | 20130808      | LSGT        | +GRNT | WRITTEN DECISION TO GRANT                         |                                                    |
| KR101296677 B1 | 20160720      | LSFE        | FPAY  | ANNUAL FEE PAYMENT                                | PAYMENT DATE : 20160721<br>YEAR OF FEE PAYMENT : 4 |

**Title:** IMAGE PROCESSING DEVICE THAT GENERATES A COMPOSITE IMAGE

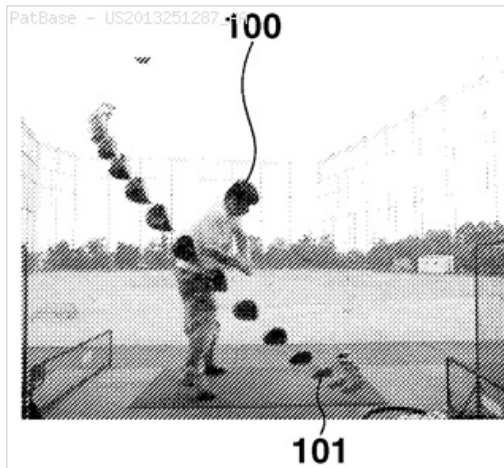
**Abstract:** Source: US2013251287A An image capture device (1) includes an image acquiring unit (71), image specifying unit (72), image selecting unit (73), and combined image generating unit (74). The image acquiring unit (71) acquires data of a plurality of images indicative of a sequence of actions of an object. The image specifying unit (72) specifies a partial predetermined action in the sequence of the actions of the object from the plurality of images acquired by the image acquiring unit (71). The image selecting unit (73) selects data of a plurality of images corresponding to the predetermined action from among the data of the plurality of images based on a specifying result by the image specifying unit (72). The composite image generating unit (74) generates one composite image from the data of a plurality of images selected by the image selecting unit (73).

**Classifications:**

**International (IPC 8-9):** A63B69/00 A63B69/36 G06K9/00 G06K9/60 G06T3/40 G06T5/50 G06T7/20 H04N5/232 H04N5/262 H04N5/91 (Advanced/Invention)

**CPC:** H04N5/2621 G06K9/00342 G06T3/4038 G06T2200/32 H04N5/2625 G06K9/60

**US:** 382/284

**Family:**

| Publication number | Publication date | Application number | Application date |
|--------------------|------------------|--------------------|------------------|
| CN103327234 A      | 20130925         | CN201310090849     | 20130321         |
| CN103327234 B      | 20160831         | CN201310090849     | 20130321         |
| JP2013198014 A2    | 20130930         | JP20120064529      | 20120321         |
| JP2016123107 A2    | 20160707         | JP20160008458      | 20160120         |
| JP5874476 B2       | 20160302         | JP20120064529      | 20120321         |
| JP6115656 B2       | 20170331         | JP20160008458      | 20160120         |
| JP6115656 B2       | 20170419         | JP20160008458      | 20160120         |
| KR101446641 B1     | 20141001         | KR20130030241      | 20130321         |
| KR20130107253 A    | 20131001         | KR20130030241      | 20130321         |
| US2013251287 AA    | 20130926         | US20130846812      | 20130318         |
| US2017048466 AA    | 20170216         | US20160335474      | 20161027         |

**Priority:**

JP20120064529 20120321 JP20160008458 20160120 US20130846812 20130318  
US20160335474 20161027

**Probable Assignee:** CASIO COMPUTER CO LTD

**Assignee(s):** (std): CASIO COMPUTER CO LTD ; KAWAMURA YOSHIHIRO ; NAKAGOME KOUICHI

**Assignee(s):** CASIO COMPUT CO LTD ; CASIO COMPUTER CO

**Inventor(s):** (std): KAWAMURA YOSHIHIRO ; NAKAGOME KOICHI ; NAKAGOME KOUICHI

**Agent(s):** SHOBAYASHI MASAYUKI

**Legal status (INPADOC)**

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| Patent          | Date recorded | Event group | Code  | Event                                       | Details                                                                     |
|-----------------|---------------|-------------|-------|---------------------------------------------|-----------------------------------------------------------------------------|
| CN103327234 A   | 20130925      | LSPB        | +     | published / reissued                        |                                                                             |
| CN103327234 A   | 20130925      | LSPB        | +C06  | PUBLICATION                                 |                                                                             |
| CN103327234 A   | 20160831      | LSGT        | +C14  | GRANT OF PATENT OR UTILITY MODEL            |                                                                             |
| CN103327234 B   | 20160831      | LSGT        | +     | granted / extensions (spc, cpc, pte)        |                                                                             |
| JP2013198014 A2 | 20130930      | LSPB        | +     | published / reissued                        |                                                                             |
| JP2013198014 A2 | 20140920      | LSSES       | +A621 | WRITTEN REQUEST FOR APPLICATION EXAMINATION | DESCRIPTION : JAPANESE INTERMEDIATE CODE: A621<br>EFFECTIVE DATE : 20140919 |
| JP2013198014 A2 | 20141225      | LSSES       | -A131 | NOTIFICATION OF REASONS FOR REFUSAL         | DESCRIPTION : JAPANESE INTERMEDIATE CODE: A131<br>EFFECTIVE DATE : 20141224 |
| JP2013198014 A2 | 20150204      | LSRE        | A521  | WRITTEN                                     | DESCRIPTION : JAPANESE                                                      |

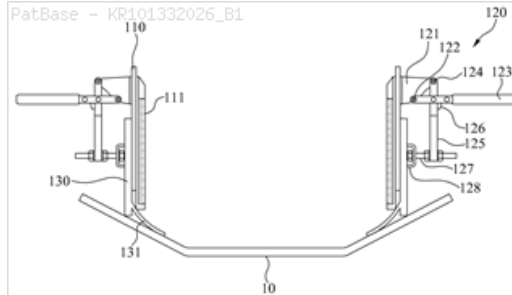
|                 |          |      |       |                                                                               |                                                                                                                                                                                                                                      |
|-----------------|----------|------|-------|-------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                 |          |      |       | AMENDMENT                                                                     | INTERMEDIATE CODE: A523<br>EFFECTIVE DATE : 20150204                                                                                                                                                                                 |
| JP2013198014 A2 | 20150513 | LSES | -A131 | NOTIFICATION OF REASONS FOR REFUSAL                                           | DESCRIPTION : JAPANESE<br>INTERMEDIATE CODE: A131<br>EFFECTIVE DATE : 20150512                                                                                                                                                       |
| JP2013198014 A2 | 20150709 | LSRE | A521  | WRITTEN AMENDMENT                                                             | DESCRIPTION : JAPANESE<br>INTERMEDIATE CODE: A523<br>EFFECTIVE DATE : 20150709                                                                                                                                                       |
| JP2013198014 A2 | 20151203 | LSRE | A521  | WRITTEN AMENDMENT                                                             | DESCRIPTION : JAPANESE<br>INTERMEDIATE CODE: A523<br>EFFECTIVE DATE : 20151203                                                                                                                                                       |
| JP2013198014 A2 | 20151216 | LSGT | +TRDD | DECISION OF GRANT OR REJECTION WRITTEN                                        |                                                                                                                                                                                                                                      |
| JP2013198014 A2 | 20151224 | LSGT | +A01  | WRITTEN DECISION TO GRANT A PATENT OR TO GRANT A REGISTRATION (UTILITY MODEL) | DESCRIPTION : JAPANESE<br>INTERMEDIATE CODE: A01<br>EFFECTIVE DATE : 20151222                                                                                                                                                        |
| JP2013198014 A2 | 20160125 | LSFE | +A61  | FIRST PAYMENT OF ANNUAL FEES (DURING GRANT PROCEDURE)                         | DESCRIPTION : JAPANESE<br>INTERMEDIATE CODE: A61<br>EFFECTIVE DATE : 20160104                                                                                                                                                        |
| JP2016123107 A2 | 20160707 | LSPB | +     | published / reissued                                                          |                                                                                                                                                                                                                                      |
| JP5874476 B2    | 20160302 | LSGT | +     | granted / extensions (spc, cpc, pte)                                          |                                                                                                                                                                                                                                      |
| JP6115656 B2    | 20170331 | LSGT | +     | granted / extensions (spc, cpc, pte)                                          |                                                                                                                                                                                                                                      |
| JP6115656 B2    | 20170419 | LSGT | +     | granted / extensions (spc, cpc, pte)                                          |                                                                                                                                                                                                                                      |
| KR101446641 B1  | 20141001 | LSGT | +     | granted / extensions (spc, cpc, pte)                                          |                                                                                                                                                                                                                                      |
| KR101446641 B1  | 20140925 | LSGT | +GRNT | WRITTEN DECISION TO GRANT                                                     |                                                                                                                                                                                                                                      |
| KR20130107253 A | 20131001 | LSPB | +     | published / reissued                                                          |                                                                                                                                                                                                                                      |
| KR20130107253 A | 20130321 | LSES | A201  | REQUEST FOR EXAMINATION                                                       |                                                                                                                                                                                                                                      |
| KR20130107253 A | 20140205 | LSES | -E902 | NOTIFICATION OF REASON FOR REFUSAL                                            |                                                                                                                                                                                                                                      |
| KR20130107253 A | 20140710 | LSGT | +E701 | DECISION TO GRANT OR REGISTRATION OF PATENT RIGHT                             |                                                                                                                                                                                                                                      |
| US2013251287 AA | 20130926 | LSPB | +     | published / reissued                                                          |                                                                                                                                                                                                                                      |
| US2013251287 AA | 20130318 | LSAS | AS    | ASSIGNMENT                                                                    | OWNER NAME : CASIO<br>COMPUTER CO., LTD., JAPAN<br>DESCRIPTION : ASSIGNMENT OF<br>ASSIGNORS INTEREST;<br>ASSIGNORS:KAWAMURA,<br>YOSHIHIRO; NAKAGOME,<br>KOUICHI;<br>REEL/FRAME:030036/0653<br>EFFECTIVE DATE : 20130226              |
| US2017048466 AA | 20170216 | LSPB | +     | published / reissued                                                          |                                                                                                                                                                                                                                      |
| US2017048466 AA | 20161027 | LSAS | AS    | ASSIGNMENT                                                                    | PARTYTYPE : OWNER<br>OWNER : CASIO COMPUTER<br>CO., LTD., JAPAN<br>OLDPARTY : ASSIGNMENT OF<br>ASSIGNORS INTEREST;<br>ASSIGNORS:KAWAMURA,<br>YOSHIHIRO; NAKAGOME,<br>KOUICHI;<br>REEL/FRAME:040146/0026<br>EFFECTIVE DATE : 20130226 |

**Title:** SKIRT APPARATUS FOR CONVEYER BELT

**Abstract:** Source: KR101332026B The present invention relates to a skirt device for a conveyor belt, which prevents transferred articles from falling to both sides of a conveyor belt and minimizes dust. The skirt device comprises: side covers which have wear liners installed along both edges of the conveyor belt; clamps which comprise brackets, clamp levers, pusher rods, hinge rods, and pushers; and a skirt which is installed by the pushers to touch the side covers and touches the top surface of the belt conveyor to minimize the falling of the transferred articles and dust. The brackets are fixed to the side covers. The clamp levers are connected to the brackets through hinge shafts to be vertically rotated. The pusher rods are connected to the brackets through another hinge shafts. The hinge rods connect the clamp levers and the pusher rods to each other. The pushers are fastened and fixed by fastening bolts.

**Classifications:**

**International (IPC 8-9):** B65G15/08 B65G21/20 (Advanced/Invention)



**Family:**

| Publication number | Publication date | Application number | Application date |
|--------------------|------------------|--------------------|------------------|
| KR101332026 B1     | 20131125         | KR20130059406      | 20130526         |

**Priority:**

KR20130059406 20130526

**Probable Assignee:**

KEC CO LTD

**Assignee(s):** (std):

KEC CO LTD ; KEC CORP

**Assignee(s):**

KEC CO

**Inventor(s):** (std):

JEH JONG WOOK

**Legal status (INPADOC)**

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| Patent         | Date recorded | Event group | Code  | Event                                             | Details                                            |
|----------------|---------------|-------------|-------|---------------------------------------------------|----------------------------------------------------|
| KR101332026 B1 | 20131125      | LSGT        | +     | granted / extensions (spc, cpc, pte)              |                                                    |
| KR101332026 B1 | 20130526      | LSES        | A201  | REQUEST FOR EXAMINATION                           |                                                    |
| KR101332026 B1 | 20130526      | LSES        | A302  | REQUEST FOR ACCELERATED EXAMINATION               |                                                    |
| KR101332026 B1 | 20130722      | LSES        | -E902 | NOTIFICATION OF REASON FOR REFUSAL                |                                                    |
| KR101332026 B1 | 20131028      | LSGT        | +E701 | DECISION TO GRANT OR REGISTRATION OF PATENT RIGHT |                                                    |
| KR101332026 B1 | 20131115      | LSGT        | +GRNT | WRITTEN DECISION TO GRANT                         |                                                    |
| KR101332026 B1 | 20161115      | LSFE        | FPAY  | ANNUAL FEE PAYMENT                                | PAYMENT DATE : 20161115<br>YEAR OF FEE PAYMENT : 4 |

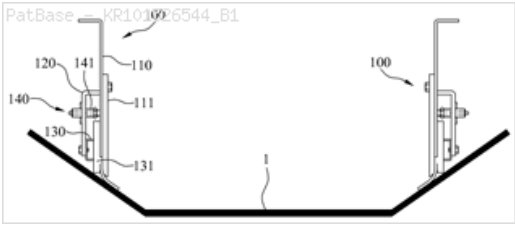
**Title:** A SKIRT PUSHER LOCKING DEVICE

**Abstract:** Source: KR101526544B The present invention relates to a skirt pusher locking device and, more specifically, to a skirt pusher locking device for fixing and spacing a skirt installed to minimize falling of goods transferred as being loaded on a conveyor belt and occurrence of dust, which comprises: a pair of side covers having a wear liner respectively installed along an edge on both sides of the conveyor belt; a cotter bracket wherein an upper portion is fixedly installed on the opposite side of the side covers wherein the wear liner is fixedly installed; a pusher member fixedly installed on a lower portion of the cotter bracket; and a locking cotter operated for disassembling and binding the skirt attached to the pusher member.

**Classifications:**

**International (IPC 8-9):** B65G21/20 B65G69/18 (Advanced/Invention)

**CPC:** B65G21/2081 B65G69/18



**Family:**

| Publication number | Publication date | Application number | Application date |
|--------------------|------------------|--------------------|------------------|
| KR101526544 B1     | 20150605         | KR20150018449      | 20150206         |

**Priority:**

KR20150018449 20150206

**Probable Assignee:**

KEC CO LTD

**Assignee(s):** (std):

KEC CO LTD ; KEC CORP

**Assignee(s):**

KEC CO

**Inventor(s):** (std):

JEH JONG WOOK

**Legal status (INPADOC)**

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| Patent         | Date recorded | Event group | Code | Event                                | Details |
|----------------|---------------|-------------|------|--------------------------------------|---------|
| KR101526544 B1 | 20150605      | LSGT        | +    | granted / extensions (spc, cpc, pte) |         |

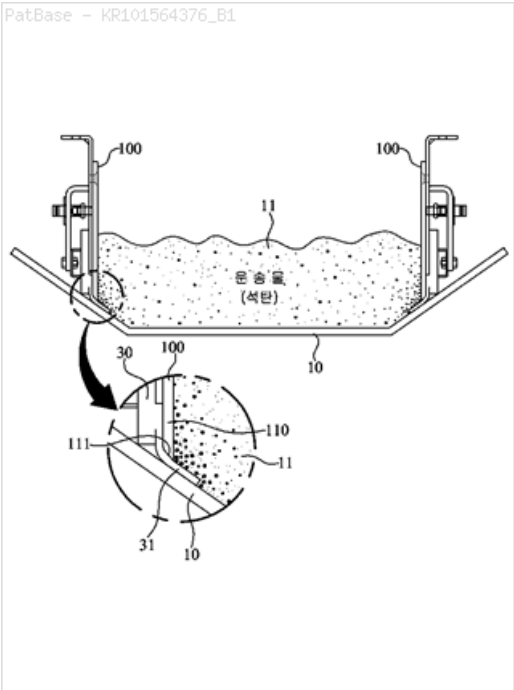
**Title:** WEAR LINER HAVING SIDE COVER PORTION IMPROVED STRUCTURE OF CHUTE LOWER OF COAL HANDLING PLANT

**Abstract:** Source: KR101564376B The present invention relates to a wear liner having an improved structure of a chute lower side cover portion of a coal handling plant and, more specifically, to a conveyor system of a coal handling plant, which comprises: a side cover individually installed along an edge of both sides of a conveyor belt; a skirt installed in a lower portion of the side cover; and a wear liner installed in the side cover individually installed along an edge of both sides of the conveyor belt for the skirt and a lower end portion to be in contact with each other.

**Classifications:**

**International (IPC 8-9):** B65G11/20 B65G21/20 (Advanced/Invention)

**CPC:** B65G11/20 B65G21/20



**Family:**

| Publication number | Publication date | Application number | Application date |
|--------------------|------------------|--------------------|------------------|
| KR101564376 B1     | 20151030         | KR20140170098      | 20141201         |

**Priority:**

KR20140170098 20141201

**Probable Assignee:**

KEC CO LTD

**Assignee(s):** (std):

KEC CO LTD ; KEC CORP

**Assignee(s):**

KEC CO

**Inventor(s):** (std):

JEH JONG WOOK

**Legal status (INPADOC)**

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| Patent         | Date recorded | Event group | Code | Event                                | Details |
|----------------|---------------|-------------|------|--------------------------------------|---------|
| KR101564376 B1 | 20151030      | LSGT        | +    | granted / extensions (spc, cpc, pte) |         |

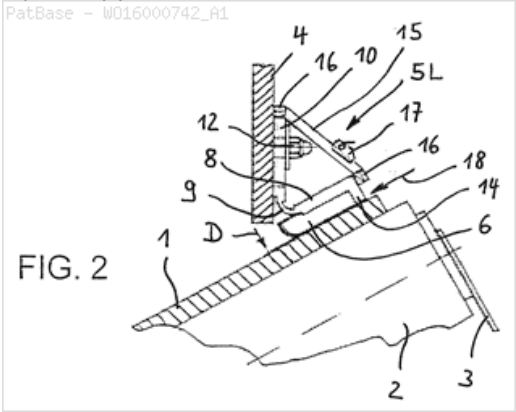
**Title:** DEVICE FOR SEALING THE SIDE REGIONS OF A CONVEYOR BELT, AND CONVEYOR BELT SYSTEM HAVING A DEVICE OF THIS TYPE

**Abstract:** The invention relates to a device (5) for sealing the side regions of a conveyor belt (1), wherein a series of sealing elements are arranged in the edge region of the conveyor belt, said sealing elements being arranged at a distance to one another and facing the surface of the conveyor belt (1), and wherein the individual sealing elements are in the form of strips, arranged at an angle to the longitudinal axis of the conveyor belt, and with their inner ends positioned in the direction of movement of the conveyor belt, said individual sealing elements being formed as narrow guide strips (6), wherein a closing strip (14) extends along each side edge of the conveyor belt (1), connecting the outer ends of the guide strips (6) arranged thereon, such that the intermediate space between the guide strips (6) is closed in an outward direction towards the edge region of the conveyor belt, and wherein the closing strip (14) is provided with at least one adjusting means (15) for adjusting the distance (D) thereof in relation to the surface of the conveyor belt (1).

**Classifications:**

**International (IPC 8-9):** B65G21/20 (Advanced/Invention)

**CPC:** B65G21/2081



**Family:**

| Publication number | Publication date | Application number | Application date |
|--------------------|------------------|--------------------|------------------|
| EP3160875 A1       | 20170503         | EP20140735908      | 20140630         |
| WO16000742 A1      | 20160107         | WO2014EP63840      | 20140630         |

**Priority:**

WO2014EP63840 20140630

**Probable Assignee:** SCRAPETEC GMBH

**Assignee(s):** (std): SCRAPETEC GMBH

**Inventor(s):** (std): DUENNWALD WILFRIED

**Agent(s):** COHAUSZ AND FLORACK; MEYER HANS JOACHIM

**Designated states:** AE AG AL AM AO AT AU AZ BA BB BE BF BG BH BJ BN BR BW BY BZ CA CF CG CH CI CL CM CN CO CR CU CY CZ DE DK DM DO DZ EC EE EG ES FI FR GA GB GD GE GH GM GN GQ GR GT GW HN HR HU ID IE IL IN IR IS IT JP KE KG KM KN KP KR KZ LA LC LI LK LR LS LT LU LV LY MA MC MD ME MG MK ML MN MR MT MW MX MY MZ NA NE NG NI NL NO NZ OM PA PE PG PH PL PT QA RO RS RU RW SA SC SD SE SG SI SK SL SM SN ST SV SY SZ TD TG TH TJ TM TN TR TT TZ UA UG US UZ VC VN ZA ZM ZW

**Legal status (INPADOC)**

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| Patent        | Date recorded | Event group | Code | Event                                 | Details                   |
|---------------|---------------|-------------|------|---------------------------------------|---------------------------|
| EP3160875 A1  | 20170503      | LSPB        | +    | published / reissued                  |                           |
| EP3160875 A1  | 20170503      | LSSES       | +17P | REQUEST FOR EXAMINATION FILED         | EFFECTIVE DATE : 20161228 |
| WO16000742 A1 | 20160107      | LSPB        | +    | published / reissued                  |                           |
| WO16000742 A1 | 20161230      | LSNE        | NENP | NON-ENTRY INTO THE NATIONAL PHASE IN: | REF COUNTRY CODE : DE     |