

(19) (KR)
(12) (A)

(51) 。 Int. Cl.7
B65H 35/07

(11)
(43)

10-2004-0088590
2004 10 16

(21) 10-2004-7014862

(22) 2004 09 21

2004 09 21

(86) PCT/US2003/002042

(87)

WO 2003/082597

(86) 2003 01 24

(87)

2003 10 09

(30) 10/104,130 2002 03 22 (US)

(71) 55133-3427 . . 33427

(72) 55133-3427 33427

(74)

:

(54)

2 (123) 2 1 (113) 1 W-가
(83) 가 . , / () 1 2 , () 1 2 1 2

2

, , , ,

가 . , (,) (Minnes

ota Mining and Manufacturing Company) #810 TM TM 가
가 . #810 TM TM
,928,864 (Reinecke) 116,599 (Walker) 4

가
, #810 TM TM (Emmel) 4,650,706
(Mertens) 4,895,746 1
가 1 () ()
1 1

가 - ®
/ ® 가
(Miles) 4,770,320
(Smith) 4,416,392 (Loder) W- 4,562,938 4,586,629 , 가 /
4,653,666 / 가 /

(Blackwell) 5,401,547
1 1 2
가 (,),
2 2
1 (backsize)

가
5,086,946 , 5,518,144 , 5,299,712 , 5,358,141 , 5,755,356 ,
348,690 , 348,484 , 359,513 , 387,806 , PCT WO 97/48561

()

lk-off)

(wa

가 .

1 , (a) , 1 1
, (b) , (c) , 가
1 2 1 2 ()
, / () 10° 30°

1 2 , (a) ,
1 2 , (b) , (d) 1 가
, (c) 가 2
, 1 2
() , / () 10° 30°

2 , (a) ,
, 가 , (b) ,
, (c) 1 2
() , / () 10° 30°

1 2 2 (a) () , () , () 1
가 2 , () 2 가 , 1
, (b) ,
, (c) 1 2
10° 30° () , / ()

3 가
() , 3 () , (a) () , (b) () ,
, () 1 1 2 , () 1 2 가 , (c) 1 2
1 2 가 , 가 .

4 W-
1 4 (1) 2
2 , (2) 2

, () , (3) () 2
10° 30°

5 W-

1 . 5 (1) 2

2

, (2) 2

가

, (3) ()

2

, ()

, (4)

2

2 가

1

2 1

3 가 1

4

5

6 5

7 5

ASTM D3811

가 (,)

(tail off)

, ' (fall back)' (,

(Crawford) 6,102,247 .

(10) (20) , (10x), (10y), (10z) (110, 120) (20) (20) (30), (40), 1 (50), 2 (60), 1 (70), 2 (80) (20) (230) (200) 1 (110) 2 (120) (10) (30) (39) (29) (29x), (29y), (290z) 1 4 (10) (29) (10x, 29x; 10y, 29y; 10z, 29z) (1) (10x, 29x; 10y, 29y; 10z, 29z) (3) 3 (10)가 (10) , (29) (10) (200) (42) 가 .

1 (110) (111), (112), (113), (114), 1 (115), 2 (116) . , 2 (120) (121), (122), (123), (124), 1 (125), 2 (126) .

1 (110) (가) (20) 1 (50) (20) 가 (가) 2 (120) (20) 가 (가) (20) 가 (110, 120) 1 3 (110, 120) (115, 116; 125, 126) (20) 가 (141) , (141) (20) 1 2 (70, 80) (73, 83) 가 .

1 2 (110, 120) (113, 123) (가) 1 2 (1 cm 4 cm) (가) 2 가 (230u) (230o) (230o) (230i) (230o) (10) (13, 123) 가 가 .

(110, 120) 3 , , (110, 120) (가) (111, 121) (20) (40) (114, 124) (110, 120) (150) (41) (47, 117) (150) , () 1 (47) (20) (40) (41) (110 120) , () () 2 (117) (110 120) (111 121) (20) (40) .

5) (20) (116) 2 (110, 120) , 1 (110) 1 (11 (30) 2 (70, 80) 1 (125) 2 (126) , (20) (71, 81) (72, 82) . (20) (20) (200) (230o) (230o) (230o) (230o) (200) (29) (110 120) (110 120) (113 123) (110 120) (110 120) (110 120) (230o) (230o) (150) (230o) / . (230o)

(110, 120) (drag force) ,
 (230o) (230o) (230u) 1 (231)
 (230i) 2 (232) (240) (250)
 (200) 가 .
 (110, 120) (113, 123) (29) (29x) (29x)
 (113, 123) (29) (110, 120) (29x)
 10° 30° (29) (29) (230o) (29) (230i)
 , 123) (200) (29x) (가) (230o) (230u)
 (230o) (230i) (230u)
 (200) (230) 가 (240) (250)
 (110, 120) (113, 123) (10) (230o)
 (230o) (113, 123) (200) () (230o)
 (230i) (230o)
 1 cm, 2 cm .
 (20) (110, 120) , 가
 (230) () (230o) (230i)
 (20) (30) (39) (230o) (230i) ()
 가) , () (110, 120) (113, 123) (200) (113, 123)
 123) , (a) (230o) (230o) (230i) (b) (200) (230)
 y) (230i) , (b) (230i) () 가) (200)
 o) (110, 120) (113, 123) (110, 120) (230i) () 가) (112,
 (39) (230o) () () (110, 120) (110, 120) (110, 120)
 122) (130) () () , () (10)
 (230) () () , (10)

(57)

1.

- (a) , , 가 ,
- (b) ,
- (c) 1 2

2.

1 , 1 2 10° 30° .

3. 2 , 1 2 .

4.

(a) () 1 2 , () 1 2 , ()

(b) () 가 2 2 , () 1 가 1 ,

1 2 .

5. 4 , 1 2 10° 30° .

6. 5 , 1 2 .

7.

(a) , , 가 ,

(b) , ,

(c) 1 2 .

8. 7 , 1 2 10° 30° .

9. 8 , 1 2 .

10.

(a) () 1 2 , () 2 , () 1 , () 1 2 , () 가 2 2 , () 2 , () 1 가 , 1 2 , ()

(b) , ,

(c) 1 2 .

11.

10 , 1 2 10° 30° .

11 **12.** , 1 2 .

13. ,

(a) () , () 1 2 , ()
 1 2 ,

(b) () , () 1 가 , 1 가 , 2
 2 가 ,

(c) 1 2 1 2 가 .

14.
 13 ,

(a) 1 1 1 cm 4 cm ,

(b) 2 2 1 cm 4 cm .

15.
 () , () 1 , ()
) (a) 1 2 2 , (b)
 , 1 2 2 , (c) W-

(1) 2 1

2 ,

(2) 2 ,

(3) () 2 , ()

16.
 15 , 2 .

17.
 15 , 10° 30° .

18.
 15 , 1 cm 가 ,

15 **19.** , 2 cm 가 ,

20.
 () , () 1
) (a) 1 2 , 2 , (b) , (c)
 , (e) 1 , (b) 1 2 , (c) 가 (a) 1 2 , (d) 2
 1 2 가 , 1 가 , () 1 2 W-

(1) 2 1

2 ,
 (2) 2 가 , ,

(3) () 2 , ()

(4) 2

21.
 20 , 2 가 .



